EXPLORING THE POSSIBILITIES OF UTILISING A PRIMARY SCHOOL FOR THE PROMOTION OF NUTRITION CONCIOUSNESS IN A RURAL COMMUNITY

By

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INTRODUCTION

Children are the wealth of the nation. They are the citizens, leaders and statesman of the future. Their health and happiness constitutes the welfare of the nation. They are the nation's biggest investment for development. Their physical and mental development determine the prosperity and peace of the future. Therefore utmost care must be exercised to promote their health and happiness and protect them from disease (Devadas et al, 1967). Programmes for the welfare of children have been receiving particular attention under the Community Development programme. The Central and State governments has accorded high priority to the education, health and welfare of children (Muncherji, 1967).

As the Prime Minister of India, Smt.Indira Gandhi (1967) has pointed out the twentieth century is the century of the child. Childhood is the most important period in a man's life. Because of the many stresses children constitute a highly vulnerable section of the population. Since the needs of the Indian child are not always met, his health in general, particularly that of the rural child is far from satisfactory. In the absence of any kind of medical aid in the villages, the infant falls an easy prey to diseases. Therefore rural child

needs regular health supervision, protection against disease and nutritious diet (Sathyanarayan, 1971).

Health is the foundation of life (Sebastian, 1972). A nation realises its potentialities through its children who are the junior partners in the glorious adventure of building up the country. Priority must therefore be given to protect the children and prepare them for the future.

The proverb, "Health is wealth" comes true in the life of every individual, society and nation. From this point of view, the importance of health for the child must be understood (Balan, 1973). Protecting today's children, developing their abilities and guiding their development are the most vital tasks of the society. Children are the blooms of tomorrow and to spread their fragrance around, they need care at an early stage (Ramani, 1974). Children constitute the human capital and should be properly cared for, so that the future citizens are morally and physically strong, and mentally balanced, capable of doing the best for community (Chowdhari, 1974).

Childhood is a precious and crucial period in terms of growth and development (Devadas et al, 1970 and Yingst, 1974). Nutrition plays an important role in the growth of the child. The relationship between nutrition and growth is difficult to establish, as illness and other environmental conditions, including socio-

cultural factors also influence growth. Thus it is difficult to differentiate the importance of nutrition excluding the two factors (Mukerji and Sethna, 1973). Among the basic needs, nutrition is interrelated to all aspects of development. The child is the product of hereditary and environmental factors and background experiences, to which he has been exposed since birth (Devadas et al, 1974).

The school teaches children the facts which are necessary for success in life. It provides opportunities to pupils to participate in social service, in health campaigns and other public activities which have any educational significance. The good school provides opportunity to every child to bring about his physical, intelluctual and economic development. It develops in the children the capacities necessary to enable them strengthen the social economic and political organisation of the country. The school tries also to make the pupils conscious of their duties and responsibilities. It inculcates in them those qualities and habits and qualifications by which they can discharge their duties towards their society and state, in an efficient and successful manner.

Schools are places where not only the children are educated, but also their parents and the whole community. School is a social institution, set up by the society for the purpose of training and bringing up children, so that they may be able to

participate intelligently and effectively in the life of the community to which they belong. The school must be connected with the life of the community. There must be a vital connection between the life of the pupils in the school and the community from which they come. Therefore schools have to play an important role in the reconstruction of the nation. The primary school period is one of the most favourable periods for establishing the desirable food habits. The school has a major responsibility to teach the child about maintaining his health and growth through the food he eats (Champakam et al, 1967).

An effective nutrition education programme in the elementary school children should create an understanding between the school and the home which will ensure the co-operation of parents in helping the child practise in his daily eating what he learns at school (Wade Bash, 1966). Teaching and learning nutrition consists of several components, namely, adequate and appropriate syllabai, good text book, possession of sound knowledge by teachers and a positive impact on children (Champakam et al, 1967).

Childhood is an impressionable age when life-time food habits are established. Teaching nutrition education during the school years will therefore leave an indelible mark on the minds of children and will influence them throughout life (Devadas, 1973).

The school would be a logical centre from which nutrition education programme could be provided for children and their families (Lillian Emmons et al, 1973). Parents are deeply interested in bringing up their children in the best way possible. They can handle them in the proper way. They know their children and understand their physical, emotional and psychological needs at various stages of their development. Organisation of an effective programme of parent education is therefore an imperative need of our time (Mohsini, 1973).

This study was undertaken with the objective of exploring the possibilities of using the elementary school as an instrument of nutrition education. It is hoped that the school will become a source of information for educating children on nutrition, through the integrated curriculum and thus parents and the whole community in improving the nutritional status. If the attempt proves fruitful, all the school teachers can be trained, to educate children in nutrition on practical lines to achieve a healthier society as part of the welfare state.

II REVIEW OF LITERATURE

The review of literature pertaining to this study is discussed under the following headings:

A. Childhood

and B. Importance of nutrition in childhood.

A. Childhood:

The review of literature on childhood period in India is discussed under the following headings:

1. Importance of Children
2. Schools for overall development.

1. Importance of children:

Life is the noblest gift of God and health is one of its greatest blessings. Health is wealth. Health is a positive state of well-being, in which harmonious development of physical and mental capacities of individual leads him to the enjoyment of a rich life (Narain, 1967). Therefore the health of the nation's children becomes the foundation for the power and happiness of its people. Health reflects the energy and capacity of people and their potentialities for productive work. Health is thus an essential resources for economic development.

According to Berthet (1965) the prime duty of the nation is to protect its children against disease and prepare them for life by helping them to live in harmony with the physical and social world. As Devadas (1971) stresses, nutrition is one of the key factors in national development.

Childhood is a unique period in terms of growth and development. Unfortunately in developing countries, childhood is marred by malnutrition, leading to high mortality and morbidity (Devadas et al, 1970).

According to Iyer (1969) India is a land of children. Today's children will grow into adults of tomorrow. Therefore the wellbeing of the country depends on the welfare and development of the child resources to the maximum advantage. The health and wellbeing of the children constitute a solid foundation for the prosperity of the nation (Bagga, 1969 and Devadas et al 1972). It is necessary that maximum attention is devoted to the protection, promotion and preservation of the health of the children.

2. Schools for overall development:

Martin (1963) states that the purpose of schooling is to prepare children for living. The schools are taking initiative in helping parents to prepare themselves and their children for wholesome satisfying living in the home, in the neighbourhood

and in the community. School looks to the parents for co-operation in another aspects of physical welfare, the work in physical education, school and home must combine to provide the child with the guiding frame work, which he needs (Alexander et al, 1960).

In recent time, schools have made an attempt to fill the educational gap left by the changing home, to supplement the home efforts with special teaching. According to Rai (1968) school is the most important formal agency of education. We cannot imagine education without the school. In fact, the school is an institution which fulfils the need of the society. In fact in the words of John Dewey, school is the society in miniature. It is the central point of the cultural life of the society. School should make attempt to bring about the development of the values of the society.

The school has facilities for teaching nutrition and for encouraging good food habits. It has teachers to guide children, it has laboratory and other equipment to make nutrition teaching practical and interesting and it has the opportunity to create situations which promote good food habits notably the school lunch.

The school is an institution which is treated as a model of the community. School is not only a social institution but

is supplementary to other. Social institutions vary in nature and function. The school teaches the children to discover, develop and use the resources at the local community level and also it serves the entire community. The school must relate itself to the larger community of the nation and the world (Singh, 1972).

The child who has the potentialities for development has to be nurtured with utmost care and attention in the school. Childhood is the significant and impressionable period in an individuals life, so that he will register adequate achievement in successive phase of development (Sarojini and Sitalakshmi, 1973).

Secondary schools have to get good examples in the form of various practices. The school prayer should be helpful in the development of patriotism in the students. It should be free from any religious bias, because students of different religions study in the school (Sharif Khan, 1973).

Aiya (1972) reported that the children of today need help to live their fruitful life in the 21st century when the impact of technology will be very much greater. To fit them to life-work experience will have to constitute an integral part of social education. Sankar Ram (1967) states that school

should function as one of the potent agencies for community development and inturn the community. To bring every child of the age group of 6 to 11 years to school and to provide him with an education related to the needs of the community. The school has to produce enlightened citizens having skilled hands, creative mind, scientific attitudes, sense of social service, dignity of labour and love for the community.

The school population should be made cosmopolitan so as to consist of students who speak different languages, belonging to different regions and having different cultural background. Students brought up in such atmosphere will definitely be good citizens of the country and contribute to the development of national integration.

Singh (1973) reveals that the student-teacher relationship has assumed great significance, as classes have become mammoth sized. Research studies have shown that inability on the part of the teacher to establish a harmonious and pleasant relationship with his students leads to ineffective teaching, many classroom problems and undesirable habits, practices and attitudes in students. School is responsible for not only his intelluctual development, but also his social, emotional and spiritual development. The teacher plays an important role in this development. The teacher can play this role only when he knows his students thoroughly and has a cordial relationship with them.

B. Importance of nutrition in childhood:

The literature on the importance of nutrition for children is reviewed under the following headings:

1. Nutritional status of children
2. Nutrition programmes for the school going children

and 3. Importance of nutrition education.

1. Nutritional status of children:

Williams (1967) emphasized that the years from 5(to 12 are significant nutritionally because, they provide time to build up body tissues and store nutrients in preparation for the rapid growth of adolescence. The elementary school child has a continuous need for an adequate diet to provide building materials for growth, furnish the energy used for the vigorous physical activities, help to maintain resistance to infection and ensure that adequate body store of nutrients are available for the growth demands of the children.

Accurate assessment of nutritional needs and deficiencies is not easy. It requires always exercise of considerable judgement, Jelliffe (1966). Attention should be given during the school years in helping pupils develop habits of eating a good diet. Good habits coupled with knowledge will help greatly in maintaining good nutritional status.

Davidson and Passmore (1969) state that in the world today most national governments have active nutrition programmes. The need for such programmes can be determined only by periodic assessment of the nutritional status of the people. Jelliffe (1966) has described suitable methods for assessing the nutritional status. In all those methods, of nutritional assessment accurate sampling is necessary. A vast amount of ingenuity has been expended on attempts to construct formulae based on anthropometric measurements to provide indices of nutritional status. Height and weight accurately recorded and properly compared against suitable standards are generally sufficient in surveys designed to assess rapidly the nutritional status of a community. A properly conducted series of individual dietary surveys gives a good assessment of nutritional intake.

Devadas et al (1968) conducted a study on nutritional status of 500 elementary school children in Coimbatore district. Their findings revealed that the mean heights and weights significantly increased with age. At the elementary school age, the boys had significantly greater chest circumference than girls. The weight of 6 to 12 years old boys was more closely related to other measurements like hip-width and arm and calf girth than height. The income level influenced the height of children, the middle income group being significantly taller than the low

income group. School lunch has increased significantly the weight of the 6 to 9 years old children as compared with children who were not participating in the school lunch. Age and sex did not influence the haemoglobin levels. The children surveyed were fairly healthy with little incidence of clinical signs of ill health.

Chawdhari (1973) conducted a nutrition survey on 529 preschool children living in the slums of Jamshedpur. Protein-Calorie-Malnutrition of various grades were seen in 32.7 per cent. About 2 per cent suffered from Kwashiorker and marammus, 24.3 per cent showed signs of clinical vitamin A deficiency and 60 per cent suffered from anaemia. Their nutrient intake determined by diet surveys showed a short fall of Calories, calcium, rhiboflavin and carotene.

2. Nutritional programmes for the school going children

The programmes pertaining to the nutrition improvement of the school going children as called out from the available literature are the following:

a. Mid-day meal programme or school lunch programme

b. Applied Nutrition Programme

c. Special Nutrition Programme

d. Nutrition programmes for children through Balwadies

e. Nutrition programmes for children under the Ministry of Health and Family Planning

and f. Nutritional care of the younger school children.

As malnutrition and undernutrition constitute serious hazards to the growth and development of children in our country (NIN, 1970), the government of India decided to give high priority to the problems of nutrition among children in the Fourth Plan. Recent surveys carried out in different parts of the country under the auspices of the Indian Council of Medical Research and the State Nutrition Units indicate that out of 10 million children in the age group of 1 to 5 years, about 50 per cent suffer Protein-Calorie-Malnutrition in one form or other. It is therefore necessary to have a supplementary feeding programme for preschool children especially those belonging to the vulnerable sections of the population. The Fourth Five Year Plan provided an integrated nutrition programme through the introduction of the special Nutrition Programme to cover 10 lakhs children in the tribal areas and 10 lakhs children in the slum areas of metropolitan cities. The Maternity and Child Health Centres and Family planning Centres situated in the areas were used for the implementation of these programmes.

a. Mid-day meal programme or school lunch programme:

Swaminathan (1970) indicates that planning for the needs of children is of great significance since the future development of the nation rests mainly on this segment of population. At present there is a great emphasis on education of children and rapid strides have been made in their enrolment. In order

to help the school going children remain in school and study better, the mid-day school feeding has been introduced. There are programmes for providing mid-day meals for children in primary schools in several states. While presenting the annual budget to the parliament, the Hon'ble Prime Minister refered to the fact that as many as 98.3 lakhs of school children in the age range of 5 to 11 years were receiving the benefits of mid-day-meals in the primary schools during 1969-70. These must be based on the general nutrient content of home diets and the nutritional requirements of these children. The meals must be so planned as to supply the children whatever nutrients are lacking in their home diets. In this connection, mothers must be educated not to cut down the home diet of the child on the plea that he gets food at school. The school meal is only a supplement to the home meals and not a substitute. The special features of the nutrition programmes for school children are: Firstly school children are still in the phase of rapid growth and their nutritional needs are far greater than that the rest of the community. Secondly, school children can be easily reached in the schools. Thirdly, since the children attend schools to acquire knowledge, they can be expected to apply the knowledge of their nutrition and improve their health status and educational performance. These factors serve to highlight the importance of school meal in the over all planning of programmes for children. The Fifth Five Year Plan aims to cover about 10 million school children under the mid-day-meal programme.

b. Applied Nutrition Programme: (ANP):

Murthy (1971) explains the objectives and importance of ANP-Applied Nutrition Programme. It has been a pilot project in many parts of our country. The ANP has now become an integral part of the Community Development Programme in the different states. By the end of the Third Five Year Plan, 222 Development Blocks in various states were covered by ANP. It was proposed to extend this programme to 1,000 Blocks during the Fourth Five Year Plan. However, now the ANP has been introduced only in to 700 blocks. The ANP also aims at improving the nutrition of the rural community by promoting the availability of protective foods such as egg, milk, fresh vegetables and fruits raised through the school garden and community poultry unit (Saraswathy, 1973).

The objectives of the Applied Nutrition Programme are to:

1. Show that protective foods such as egg, milk, fish and fruits can be produced locally in sufficient quantities with community efforts.
2. Encourage the vulnerable sections of the population, namely, children and women who are pregnant or breast feeding to eat more of the protective foods.

and 3. Educate the community on the value and usefulness of better nutrition and how this can be achieved through community efforts.

The ANP consists broadly three aspects production, training and orientation, and nutrition education. It is not a relief programme or a feeding project. It is mainly a programme for educating people on how they could help themselves to be healthy. The main aims of ANP is to improve consumption of better foods. Therefore it is not primarily a production programme. The ANP school meal service is a teaching aid. It aims to show the varieties and amount of food that the village families should provide for their children. To serve this purpose, school and kitchen gardens are being promoted in which the effort is stressing production of the most nutritious foods. Thus the ANP in essence is a programme of nutrition education of the community.

C. Special Nutrition Programme: (SNP):

The first crucial period involving even risk of death is the first month of the infant's life (Rao, 1972). This situation is mainly because of the malnutrition of the mother during pregnancy. The SNP Special Nutrition Programme aims at correcting this situation. Three groups who are vulnerable, namely, preschool children, pregnant and nursing mothers are the beneficiaries under the SNP. Orginally known as Crash Nutrition Programme, this project covered about 6,80,000 children in the 0.3 year age range in 1970-71. The supplement given to the

beneficiaries varied from group to group. The government had earmarked a budget of 23.5 paise per child per day under this programme. Milk is certainly the best source of quality protein. Milk has therefore been recommended as an essential item of food for children. The SNP strictly speaking is a short term effort to improve the nutritional status of preschool children, pregnant and nursing mothers at their most vulnerable period. The ultimate aim of the SNP is nutrition education. The programme is intended to make the community realise the importance of good nutrition and make itself, self reliant in nutrition.

d. Nutrition programmes for children through Balwadies:

For children in the age range of 3 to 5 years, the Fourth Plan initiated during 1970-71 a feeding programme in selected Balwadies run by voluntary organisations, as well as by the Departments of Tribal welfare and Harijan welfare in different states (NIN, 1970). In nutrient contents, the programme provided 300 Calories and 15 grams of protein per day per child per 250 days in the year. Efforts were made to utilise whatever local food was available and to encourage local voluntary organisations to look after the preparation and supply of food to children. In areas where local foods are not easily available, processed food in the form of Balahar was supplied. The raw materials for the preparations of Balahar are likely to be supplied free-of-charge by CARE with the cost of preparation and administative charges being met

from the budget. This provision will benefitted about 68,600 children in the age range of 3 to 5 years.

e. Nutrition programmes for children under the Ministry of Health, Family Planning and Urban Development:

Under the Ministry of Health, Family Planning and Urban Development the programme of nutrition for children covers three major schemes such as skim milk feeding through Maternity and Child Health Centres, Prophylaxis against nutritional anaemia and prophylaxis against vitamin A deficiency blindness. UNICEF has been supplying skimmilk powder for supplementary feeding programmes for infants, children, pregnant and lactating mothers through the Health agencies during the year 1970-71. Five lakhs of children in the age range of 0 to 3 years will continue to get the benefit of this service.

The second scheme seeks to provide preventive measures against nutritional anaemia in mothers and children by administering ferrous sulphate and folic acid though the Maternity and Child Health and Family Planning Centres. A scheme for controlling the blindness in children caused by vitamin A deficiency is being implemented by the Department of Family Planning, Ministry of Health during the Fourth Five Year Plan.

f. Nutritional Care of the younger school children:

Vidaya Ragavan (1973) exhorts that children of the school going age are playful and very active. So they need food which provides them sufficient energy. Children attending school are exposed to a risk of infection. For this purpose, the diet must contain the protective nutrients particularily vitamins through greens, common fruits like papaya and mango. Parents have to play an important role in making the children consume enough amounts of good quality foods. Another important point is that children should not be given light snacks at the odd time, the child's appetite will be affected and intake at regular meals will be decreased. It is desirable to cultivate regular food habits among children. Personal cleanliness is another important factor. Children must be taught to wash their hands before starting the meal. Dirt is responsible for spreading many an infactious disease. Parents themselves can set an example in this regard.

3. Importance of nutrition education:

The importance of nutrition education is discussed under:

a. Meaning and scope of nutrition education

b. Role of elementary school in imparting nutrition education.

a. Meaning and scope of nutrition education

Nutrition plays an important role in India's fight against malnutrition (Balcomb, 1971) inorder to change the food habits of the people, they need to be motivated intensively through organised, consistent, continuous and convincing educational effort (Devadas, 1972).

Nutrition education has been recognised as one of the pre-requisites for improving the nutritional status of any group. It is the foundation which any programme for nutritional improvement can be built (Usha et al, 1965, Devadas and Chandra Sekar, 1970). Good health promotes complete, mental, physical and social wellbeing. Diet and nutrition therefore assume an important place in good health (Social Welfare, 1972). Devadas (1968) defines nutrition education as being concerned not only with what the individual knows but what he does about food and his diet. Albanese(1971) defines nutrition education as a means of translating nutritional requirements into food and adjusting food choices to satify cultural psychological and economic needs.

Nutrition education can of great benefit to children and youth if a more practical approach and evaluation of nutrition programmes are made and guides and materials for programming and evaluating nutrition education are provided. (Cunnon et al, 1972).

According to Mrak (1972) nutrition education must be aggressive, positive, and forward-looking. As stressed by Corden (1973) nutrition education is as important for the healthy individual consuming his normal meal pattern as for a person with specific medical-nutritional problem requiring a therapeutic diet. The most important aspects of nutrition education in relation to healthy members of the community are maintenance of health the prevention of malnutrition. Leverton (1974) defines nutrition education as a multidisciplinary process that involves transfer of information of motivation and modification of food habits.

b. Role of elementary school in imparting nutrition education:

Nutrition plays an important role in the growth of the child. The relation between nutrition and growth is difficult to establish as illness and other environmental conditions including sociocultual factors also influence growth (Mukerji and Sethna, 1973). Devadas (1970) states that good nutrition in childhood and throughout the life span is of paramount importance in fostering the physical, mental and social growth of the population. According to Alquesa (1968) the value of nutrition education to growing children cannot be over emphasised. Young children are eager to know about the food they eat.. They need to be taught the meaning of nutrition through a study of food that will enable them to grow strong

and healthy. ICMR (1966) Copping (1968) and Solon (1969) have included the school children among the special categories to be taught nutrition since they are the future parents and potential leaders. Ranganathan (1963) puts forth thatit is the prime responsibility of adults to provide full protection and support for the healthy growth of children, so that they might become bright and useful citizens tomorrow.

As Devadas (1970) and Shamsuddin (1971) state, children are not set their in ways. They accept new knowledge and new habits as part of growing up. Once they acquired good food habits they will let them permanently. A heavy respensibility therefore lies on parents to see that the children are fed properly, they study well and become useful to the society and country at large. Today's children are tomorrow's citizens. Proper nutritional care of children will yield rich dividents in the long run.

As Eppright (1971) advises, pupils are to be helped to:

i. Select their own foods in accordance with their challenging physiological and economic conditions and nutritional needs

ii. Evaluate, to some extent, their health structure

iii. Understand the significant role of nutrition and the intelligent use of country's food in improving the quality of life.

and iv. Understand the meaning of hunger and starvation to the individual, family or society.

Swaminathan (1971) Shamsuddin (1971) Dhillon et al (1971) and Balcomb (1972) state that the important aspect of nutrition education in schools is that children are the parents of the future and the useful citizens of tomorrow. According to Nanavathy (1972), the child has to be taken as an entity, whose varied needs in terms of health, nutrition education and welfare have to be met in an integrated manner, in all stages of his growth.

The FAO spellout (1964) stresses that nutrition education should reach all the children as dietary habits are largely formed at the impressionable school going age. This can be made possible if nutrition is included as a subject in the regular curriculum throughout the country.

Cortes (1973) states that as society becomes more complex, food choice activities require that the person who chooses, possesses a better background knowledge about foods and nutrition they provide. It is desirable that such knowledge becomes assimilated in the growing process like arithmetic and spelling.

It is stated that nutrition education is directed towards the family. Proper care must be taken to approach people in the rural areas, in their farms and villages, and those in the urban localities in their homes. Programmes of education in nutrition are most effective when a coordinated approach is

made, (Directorate of visual Publicity and advertising, 1964).

Reporting their study Rao and Balasubramaniam (1962) aimed at finding out how best the existing health personnel could be utilised for nutrition education programmes in the village. The mothers were informed about the value of protective foods and motivated to feed their babies from six months onwards with the foods advocated. Mothers were approached individually in their own homes, along with other family members. They appeared to respond more favourably to the nutrition education programme.

Nutrition education factors are of utmost signigicance in the child's total growth and development and in the provision of a totally adequate environment. More and more inter-disciplinary approach must be used, if the total needs of the child are to be met.

Juhas (1973) opines that young children learn through first-hand experience. Their world is a laboratory. Hence food services and eating routines must be planned with educational objectives in mind if full benefits are to be derived.

Williams (1967) states that school has an important influence on the lives of its pupils. Creative teachers will find ways to bring nutrition into classroom in an interdisciplinary presentation, when it seems appropriate, thus giving

nutrition a broader and deeper meaning. Interest developed in school children will serve as a foundation for continuing nutrition projects in the home.

The normal school system is an obivious channel through which nutrition education can be imparted to children, (Social Welfare, 1972 and NIN, 1973). According to Robson (1972) nutrition education in the schools should begin in the primary grades and carried through the secondary schools, universities, medical and dental colleges. Nutrition information presented to a child in the school must be such that it not only creates interests and motivates the pupil but also interests, teaches and motivates the mothers.

According to Mrak (1972) the objectives of nutrition education in schools are to:

i. Motivate children to prefer foods which are best for their health and activity

ii. Educate about good food and hygiene

iii. Encouraging the use of locally produced foods, and inform about their values.

The aims, efforts and methods used will naturally vary according to target groups. Nutrition should never be taught as a subject in which finality has already been reached but only as a living science.

Inorder to make nutrition teaching effective in the elementary schools. The following recommendations by Cortes and Standal (1973) are made.

i. Appropriate teaching techniques should be used, (in order to develop techniques a survey is needed for guidelines).

ii. The teacher should possess a good-background in basic information.

iii. Attractive and interesting materials for children should be available for ready use

iv. Techniques which catch the imagination of the children should be developed.

v. The school lunch should serve as a teaching laboratory where children, and teachers put nutrition facts into operation.

The results of recent study conducted by Cunnon et al (1972) express basic needs among teachers and other community workers for basic information on food and nutrition. The worker's lack of knowledge of existing resources in teaching in a way will affect progress of nutrition education.

Devadas et al (1973) conducted a study on the scope for nutrition education in the elementary school programme. It was found that the scope of nutrition education was vast when imparted through an integrated curriculum. Special education for children using school garden, animal demonstration and audiovisual aids was possible. The different methods of imparting nutrition were compared and the impact of educating children on the food habits of the families was evaluated.

The methods employed in nutrition education for any group as given by Dantyagi (1968) will depend upon the local conditions. Ritchie (1967) lists the following educational methods techniques and aids for nutrition education.

i. Action methods:-

Group discussion and decisions

Workshops

Demonstrations

Role playing

Dramatisation

Interview with individuals

ii. Aids to education in nutrition:-

The written word

Flannel graph

Projected aid

Radio

Tape recorders

Charts, posters, wall news papers, exhibits and models.

Devadas (1968) stated that there are several methods available for extending nutrition information. Efficiency and satisfaction for the worker will determine the methods to be used. There is no single way for imparting nutrition education correctly. Some of the teaching methods referred to by Devadas (1969) are traditional indigenous media like folk songs (Villupattu)

street dramas, (Therukoothu), puppet shows and folk plays which are affective in educational work with illiterate groups. Modern media like posters, radio and film shows have a vital part to play in the education of the illiterates. Cooking demonstrations, exhibitions and individual contacts are other practical methods useful for nutrition education.

Parvathi Rao (1974) opines that visual aids are very useful for explaining an idea quickly and impressing it in the minds of the children. They are important because they are used for every nutrition teaching. These aids can be of many types such as flash cards, picture cards, flip charts, games, puzzles, wall posters and models. The preparation of these aids can form part of the student's activities or assignments.

Nutrition exhibition in schools serves an important purpose, UNICEF (1971). On special occasions the exhibition can be thrown open to the parents and the general population in the village or town. A well planned, properly maintained exhibition, will also lighten the work of the teacher. One of the important ways of showing the effect of good nutrition is to exhibit experimental animals. The school garden will also come in handy for such exhibitions. Plants at different stages of growth may be exhibited to show how quickly they can be growning if properly nourished.

III EXPERIMENTAL PROCEDURE

The experimental procedure pertaining to this action. Research study on "Exploring the possibilities of utilising a rural school for the promotion of nutrition consciousness" included the following aspects.

A. Planning nutrition education programmes for school going children

B. Carrying out the nutrition education programme

and C. Evaluating the impact of nutrition education programmes.

A. Planning nutrition education programmes for school going children:

This planning aspects included:

1. Selection of the School and the selection of the subjects

2. Collection of background information

3. Analysis of the syllabus and the selection of the topics for nutrition education

4. Selection of the methods

and 5. Dutlining the plan of lesson.

1. Selection of the school and the selection of the subjects:

Two elementary schools were selected for this study, one as an experimental group and other as the control group. The

school at Sugunapuram village in Perur Panchayat Union was chosen as the experimental school for imparting nutrition education to the School going children and the school at Kolathupalayam village in Perur Panchayat Union was kept as the control group (Figure I).

The particular two schools in Perur Panchayat Union were chosen because of the following reasons:

1. The village in which both schools were situated had not been touched previously by any nutrition programmes.
2. The conditions prevailed in both schools were similar with respect to type of teaching and activities
3. The authorities were interested and co-operative and
4. The area was untouched by other projects which might influence this project. The details of the samples selected are shown in Table I.

TABLE I

NUMBER OF CHILDREN IN THE SCHOOL

Age range	Percentage of children EXPERIMENTAL				Percentage of children CONTROL			
	School lunch		Non School lunch		School lunch		Non School lunch	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
5-6	2	16	16	20	8	39	8	41
6-7	20	16	19	24	44	11	31	17
7-8	50	29	36	34	24	25	39	9
8-9	11	9	5	6	8	16	12	21
9-10	17	28	10	10	12	3	8	6
10-11	--	2	13	6	2	6	2	6
11-12	--	--	1	--	2	--	--	--

Total number of school lunch children 67 + 67
Total number of non-school lunch children 73 + 73

FIGURE - 1

MAP OF PERUR PANCHAYAT UNION INDICATING THE SELECTED VILLAGES FOR THE STUDY

One hundred and fourty children each constituted the experimental and control groups respectively. From both the schools, 67 school lunch children and 73 non-school lunch children were drawn as samples for the study.

2. Collection of Background information:

Three sets of interview schedules were used. One for children, one for the mothers of children and other for teachers in the selected two schools. Interview schedule was used because it is appropriate when dealing with young children and those of limited intelligence, (Best, 1963). According to (Young, 1962) it is a systematic method by which a person enters more or less imaginatively into the inner life of a comparative stranger.

A dietary survey was conducted to elicit information about the dietary practices of the mothers and a questionnaire was also used to elicit information about the nutritional knowledge of the mothers. The questionnaire used is given in Appendix I.

The investigator selected 180 mothers from both the schools. These included 10 mothers of school lunch children and 10 mothers of non-school lunch children, from each class, except the fifth standard in both the schools. Since the number of children in the fifth standard was small as compared to other classes, this type of selection was inevitable.

An interview schedule, as given in Appendix, II was developed and administered to the children in order to test their initial nutritional knowledge. The schedule consisted of questions on importance of school lunch, opinion regarding school lunch, meaning of nutrition, important functions of nutrients and their sources.

An interview schedule as given in Appendix III was administered to the teachers in order to elicit the information regarding their experience, training and details about their schools.

The heights and weights of the children and clinical assesament were recorded at the beginning and at the end of the study using the format given in Appendix IV.

An analysis of the data gathered by administering the questionnaire to the two schools in the experimental and control school revealed the following aspects.

a. Details regarding the family background and dietary practices of the homemakers

b. Detailed information about the school and the teachers.

c. Opinions of the children about the school lunch and their participation in the school lunch.

a. Details regarding the family background of the homemakers.

i. Age range of the homemakers:

Table II gives the age ranges of the homemakers.

TABLE II

AGE RANGE OF HOMEMAKERS

S.No.	Age range	Percentage EXPERIMENTAL	Percentage CONTROL
1.	20 - 25	7	3
2.	25 - 30	19	19
3.	30 - 35	22	38
4.	35 - 40	49	32
5.	40 - 45	2	8
6.	45 - 50	1	-

A majority, 35 - 45 per cent of the homemakers were in the age range between 30 to 40 years. Only 10 per cent of the home makers were above 45 years.

ii. Type of Families:

Among the 180 families surveyed in the experimental and control villages, 90 to 95 per cent were nuclear and the

rest belonged to joint families thus showing the rapid decline of joint families in the village.

iii. Educational level of the homemakers:

The educational levels of the home makers are shown in Table III.

TABLE III

EDUCATIONAL LEVELS OF THE HOMEMAKERS

S.No.	Educational level	Percentage EXPERIMENTAL	Percentage CONTROL
1.	Illiterate	60	59
2.	Primary	32	28
3.	Elementary	4	5
4.	Highschool	2	5
5.	College	2	3

Prevalence of a high illiteracy among the rural home makers is evident in that 60 per cent in the experimental and 59 per cent in the control village were illiterate.

iv. Family Composition:

Details of the family composition are given in Table IV.

TABLE IV

FAMILY COMPOSITION

S.No.	Number of children in the family	Percentage EXPERIMENTAL	Percentage CONTROL
1.	1	17	16
2.	2	27	37
3.	3	35	35
4.	4	15	5
5.	5	4	4
6.	6	2	3

It could be seen that 35 per cent of the home makers in the experimental and control villages had two to three children each. Only two and three per cent of the families had five to six children. (Figure 2) Family planning efforts appear to have succeeded in these villages.

v. Occupations of the Heads of the families:

The occupations of the heads of the families are given in Table V.

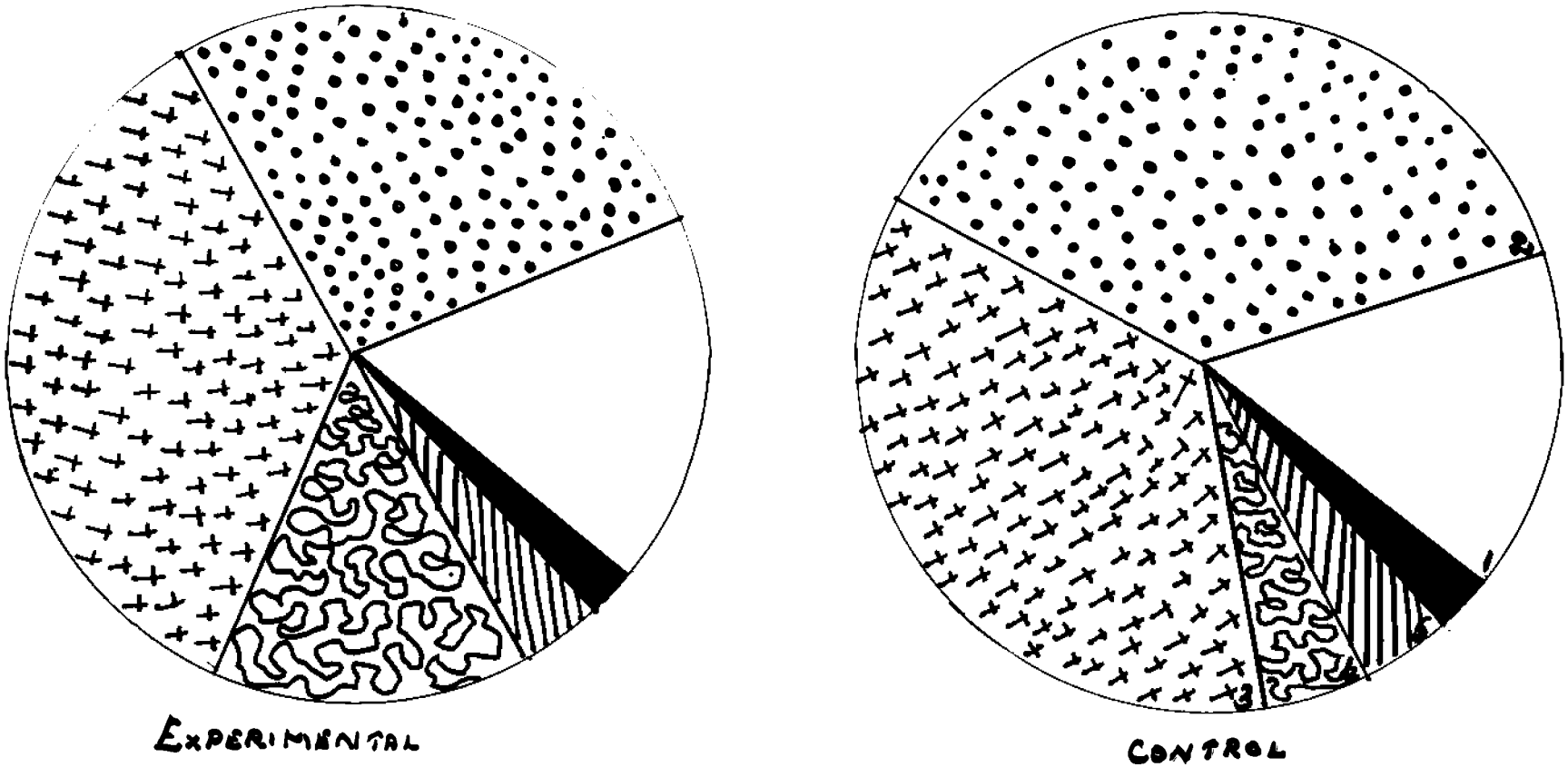


FIGURE · 2

Pie Diagram indicating the number of children of families of selected villages.

TABLE V

OCCUPATIONS OF THE HEADS OF THE FAMILIES

S.No.	Occupation	Percentage EXPERIMENTAL	Percentage CONTROL
1.	Skilled work	44	49
2.	Coolie	33	31
3.	Managerial work	17	11
4.	Unemployed	6	9

A majority, 44 and 49 per cent of the heads of the families were skilled labourers, followed by 30 - 35 per cent engaged in coolie work.

Thus all the families of in both experimental and control villages belonged to the low socio-economic income group. Their earnings were Rs. 200-400 per month.

vi. Details of food production:

Only eight families possessed cultivable land in the experimental village and three in the control village. The land was utilised for the cultivation of cereals, sugar cane and vegetables.

Eighteen families had other means of food production through kitchengarden, cattle and goat rearing and poultry in the experimental village. On the other hand in the control village only two had kitchengarden and five had cattle and the food produced by all these means were utilised by the households.

vii. Awareness about Mahalir Manram:

In the experimental village, all the mothers were aware of the newly created Mahalir Manram (Women's Club) however, only out of 90 families 15 were members in the Mahalir Manram, where as in the control village, there was no Mahalir Manram at all.

i. Experience of teachers:

All the teachers, four in the experimental school and six in the control school were surveyed. Among the four teachers, two in the experimental school had eight years of experience in teaching, one had 10 years and the remaining had 13 years of experience in teaching.

In the case of the control school, among the six teachers four had eight years of experience, one had ten years and the head master had 15 years of involvement in the teaching profession.

ii. Training of teachers:

All the teachers in the experimental and control villages had two years of formal teacher training following the prescribed course of studies from Coimbatore Training School. The subjects studied during training were psychology, physical education, mathematics, science and languages. They had different types of additional training such as basic training and basic retraining for three months.

iii. Details about school:

The experimental school had been established at Sugunapuram village in 1966. The school feeding programme was started in 1968. The school had a strength of 75 children, from one to fifth standard in the beginning. Now the strength had increased to 140.

The control school was established at Kolathupalayam in 1954 with two staff. The feeding programme was started in 1955. In the beginning, the allotted capacity of children was 80. Now there are 140 children enrolled. The age range of children in both the schools was 6-12 years, both, boys and girls.

C. Opinions of children about the school lunch and the participation of children in school lunch:

The details regarding the children and their opinions are presented under the following headings:

i. Number of children attending school lunch

ii. Foods provided in school lunch

iii. Qualities and quantities of foods given in school lunch

iv. Children's opinion about the school lunch

v. Interest in learning nutrition

i. Number of children attending school lunch:

Among the 280 pupils surveyed in both the schools, 43 per cent were attending the school lunch programme, and 57 per cent did not. When they were asked as to why they were attending the school lunch, there were responses only from 15 per cent in the experimental as liking, long distance of the home, tasty foods and delay in preparing foods in the home; 25 to 30 per cent of children in the control school gave the reason such as liking and poverty.

ii. Foods provided in the school lunch:

The foods provided in the experiment school were tamerind rice or tomato rice or CSM uppuma. In the case of control school only two varieties such as wheat uppuma or tamarind rice were given; 80 to 90 per cent of children in both the schools knew the names of the foods provided in the school lunch, whereas, the non-school lunch children did not have any idea about the foods provided in the school lunch.

iii. Quality and quantities of foods given in school lunch:

Ninety five per cent of the children in experimental school and 90 per cent of children in the control school were satisfied with the quantity of food given to them. The children were not participating in the preparation of food, since there was an ayah for this purpose.

iv. Children's opinion about the school lunch:

Table VI shows the children's opinion about the school lunch

TABLE VI

OPINIONS OF CHILDREN ABOUT THE SCHOOL LUNCH

S.No.	Opinions	Percentages of EXPERIMENTAL		Percentage CONTROL	
		School lunch	Non-school lunch	School lunch	Non-school lunch
1.	~~Tasty~~ Foods are tasty	28	-	24	5
2.	Quantity is sufficient	10	1	5	1
3.	Helps the poor children	6	13	--	4
4.	Helps the children to become healthy	--	1	--	1

Fifty six per cent of the children who were attending the school lunch in both schools had no opinion to offer. Only 5-28 per cent expressed different opinions about the school lunch such as sufficient quantity, tasty foods and helps the poor children. While these opinions are positive, a larger number of children should be made aware of the school lunch.

v. Interest in learning nutrition:

A majority, 85 per cent, of the children showed interest in learning about nutrition. They were eagerly waiting for these opportunities. Before conducting this study, nobody had taught nutrition in both the schools.

The information thus collected from the children and their families formed the basis for selecting the topics for nutrition education programme.

3. Analysis of the syllabus and the selection of the topics for Nutrition education:

The main objective of this study was to find outthe possibilities of utilising the rural school for creating nutrition consciousness in the children and their parents through an integrated curriculum. Therefore the background of the schools, teachers and children was studied and the nutrition education programme ~~in~~ introduced. It consisted of the following activities.

a. Orienting teachers for the possibilities of imparting nutrition education through the curriculum.

b. Teaching nutrition through the school curriculum

and c. Conducting the nutrition education programme for the selected group of children using different methods.

a. Orienting teachers for the possibilities of imparting nutrition education through curriculum:

Nutrition was included under each subject in a relevant manner and the teachers were given training, as to how to conduct nutrition classes to the children. The contents were explained to the teachers with the help of charts, posters and flash cards

as shown in Figure 3. Through this orientation, the teachers got an idea about nutrition, and about using different methods and audiovisual aids to make learning realistic simple and interesting.

b. Teaching nutrition through the school curriculum:

Nutrition was incorporated wherever possible in the school subjects such as mathematics, social studies, general science, Tamil and Physical education, in the curriculum. These nutritional concepts were taught to the teacher with suitable aids.

C. Conducting nutrition education programme for the selected groups of children using different methods:

Based on the initial knowledge of the children various nutritional themes were selected and taught to 140 pupils in the experimental school with the help of approved audio-visual aids such as films, songs, posters, charts, field trip, exhibition, result demonstration and story telling. Two or three methods were used for each theme. The lessons were imparted even during the lunch interval, physical training hour and leisure hours. The control school was periodically visited by the investigator without interrupting the course. They had no nutrition education through the curriculum.

FIGURE 3

Orientation class to the teachers in the experimental school

4. Selection of the methods:

The topics selected and the methods suggested are given below.

Audio visual aids were used because they accelerate and sharpen the learning process and help pupils master more subject matter and skills in a shorter span of time, (Goodwin, 1969). Audio visual aids motivate the child's learning by arousing his interest in a number of ways. It makes the child's experience meaningful, (Chakrabarthi, 1967).

5. Outlining the Plan of Lesson:

As a guide line for this study a detailed plan of action was prepared based on the topics, methods and contents. That the education imparted should become integral part of the curriculum, by enriching the experiences and widening the horizons of knowledge and propagating useful information to the whole community was the chief aim of this effort. The detailed plan of action is depicted in Table VII.

TABLE VII

INTEGRATED CURRICULUM
LESSON PLAN

Name of the school: Sugunapuram Perur Panchayat Union Elementary School.

Subjects: Nutrition in Tamil and Science.

Class : I Std.

S.NO.	THEME	CONTENT	LESSON	TEACHING AID	ASSIGNMENT
1.	Name of the vegetables and their importance in promoting growth	The names of the vegetables like cauliflow er, Beetroot, onion cabbage, carrot, radish and potato Cabbage has Vit.C for healthy gums and wound healing. Carrot and beetroot Contain vitamin A for good vision. Cauli flower, potato give energy	Motivation: Thepicture of vegetables as well as the actual vegetables will be shown to the pupils . Pupils will be asked to state the importance of vegetables. Vegetables. Presentation: The pupils were taught the names of vegetables. Recapitulatio n: Questions were as ked regarding the subject to check to whether or not they have understood the lesson	Picture o f vegetables and actual vegetables.	Write the names of vegetables taught.
2.	Importance of milk, greens and egg	Importance of using milk, greens and egg in the diet of school going-childre n	Teeching students a song about milk, greens and egg. They are asked about the nutrients present in milk and other foods.	A mini chart	The pupils are asked to repeat the song.

Contd....

S.NO.	THEME	CONTENT	LESSON	TEACHING AID	ASSIGNMENT
3.	Good eating habits	Good eating habits; prayer before the meals, cleaning the places for sitting, cleaning hands, avoiding waste, cleaning the mouth after the meals.	**Motivation:** The picture showing good eating habits are shown to motivate the children **Presentation:** The theme is demonstrated by a child in the group. **Recapitulation:** Ask pupils to practise daily during meal time.	Demonstration and charts.	Pupils practise daily during the meal time.
4.	Teaching the names of different fruits and the nutrients present in them.	Names of fruits, and the nutrients present in each fruit.	**Motivation:** The students are asked to learn the names of fruits in the market to motivate them. **Presentation:** The students are taught the names of new fruits and their importance.	Flash cards	Ask pupils to write the colour of each fruit.

Name of the school : Sugunapuram Perur Panchayat Union Elementary school.

Subject: Nutrition in Tamil and Science

Class : II standard.

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
1.	Pongal Thirunal, impoetance of hand pounded rice, fresh vegetables, fruits and milk in man's diet.	Importance of cereals, especially rice, fruits vegetables and milk in the diet.	Ask questions about the Pongal vizha Presentation: Teach the importance of hand pounded rice and fruits for their nutrient content; of vegetables like carrot papaya and greens for their rich vitamin-A and C and iron contents; milk products for their calcium content.	Samples of food stuffs.	During Pongal celeberations ask children to participate in it.
2.	Importance of milk	Importance of milk our diet. Milk and milk products.	Motivation: Show charts on milk. Importance of milk as a main source of vitamin A.	Charts on milk and its various products are shown.	Ask pupils to repeat the use of products of milk at home.

S.No.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
3.	School garden;	Importance of raising a school garden; Importance of fresh vegetables such as green leafy vegetables, tomato, papaya, in the daily diety	School garden can give vegetables for the mid-day meal programme. Tomatoes are rich in Vitamin C. Green leafy vegetables are important for healthy bones and teeth and they are important for their healthy circulation, Papaya is rich in vitamin-A which is good for vision.	Picture of school garden	Start a school garden and let pupils work in the school garden by taking turns.

NAME OF THE SCHOOL:

CLASS : III STANDARD

SUBJECT : NUTRITION IN MATHEMATICS SCIENCES AND ENGLISH

S.No.	THEME	CONTENT	LESSON	TEACHING AID	ASSIGNMENT
1.	Addition and substraction	Importance of the school lunch programme and school garden in the school	Give the following mathematics problems I. In the class there are 50 pupils. Out of 50, 20 take school lunch. After one month, 10 more pupils join the school lunch programme. Now how many students are taking school lunch.	Chart	Working out problems
			II 20 pupils were working in the school garden. 12 were preparing the soil and the rest were sowing vegetables. How many pupils were sowing?	Chart	Working out problems
2.	Importance of balanced diet	Importance of vitamins, proteins, calories and minerals for growth	Selection of vegetables, fruits and cereals for making the diet adequate. A picture of two children depicting a healthy and a sick child are shown.	Charts, Filmshow (balanced diet) Epidiascope slides.	Notes the different between the children with adequate diet and without it.

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
3.	Complete the following sentence using the most appropriate common noun.	Concept development of propernoun and common noun	Complete the sentence using the common noun: items: big pieces, glass cow, tomato, cheese. 1. Mummy cuts the vegetables into _____ 2. We grow _____ in our school gardens. 3. At house we drink a_____ of milk 4. The _____ gives us milk. 5. With milk we make _____.	---	Fill up the blanks with proper works

NAME OF THE SCHOOL:
CLASS : IV STANDARD
SUBJECTS : NUTRITION IN TAMIL, SCIENCE AND SOCIAL STUDIES

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
1.	Basic five food groups	Importance of foods used in each group.	Cereals are rich in calories pulses are rich in protein, Roots and tubers and other vegetables are rich in vitamins and minerals. Milk and milk products are rich in vitamin A, calcium and protein Sugar and Jaggery are taste stimulators.	Charts, samples	Questions regarding the foodstuffs present in each group
2.	Happy family	Importance of children in a family.	Importance of using fresh vegetables for cooking foods in the family.	Picture of a happy family	Ask pupils to write a brief note on a happy fami
3.	Nutritional deficiency diseases.	Types of disease due to the lack of nutrients	Motivation: Cardboard cut outs regarding the deficiency conditions are shown to the pupils. Cases of deficiency brought explanations.	Slides and cut outs	

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
	Nutritional defi-fie ncy disease		Presentation: Pupils are asked to write vario us nut-ritional disease.	Card board cutouts	Ask pupils to write the names of dis-cases caused by deficiency of vitamins and minerals.
4.	Agriculture in India	Imp ortance of foods in the diet	Importance of cereals pulses, fruits and vegetables. Energy yielding foods, body-building foods and pr/ote-ctive foods. Cereals and pulses will come under energy yielding foods. Milk and milk products will come under body build-ing foods. All the vegetables and fruits will come under prot-ective foods, since they contain vitamins and minerals.	Showing a map of India	Ask the pupils to show the places in eam a map of Indian wh re agri-culture is the main occupat-ion.

NAME OF THE SCHOOL :
CLASS : V STANDARD
SUBJECTS : NUTRITION IN SCIENCE AND MATHEMATICS

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
1.	Importance of Vitamin A.	Effect of vitamin A deficiency	Story: Many children are playing in the ground. Among them Ramu and Gopu are friends. They too are playing happily. After 6'O'clock in the evening, Gopu finds it difficult to continue his play and he feels tired. He went and sat in a corner near a house. Ramu notes his condition so he takes Gopu home. The next day, Ramu's mother met Gopa's mother and ask about the inability of Gopu to play after 6 O'clock. Gopu's mother replied that Gopu is unable to see clearly after 6 O'clock.		
	Impo rtance of Vitamin A in the diet.	Effect of Vitamin A deficiency	Ramu's mother tells Oh: it is Night blindness, for this you have to give immediate treatment, other wise it will affect the eye sight completely." Gopu's mother asks painfully, "What can I do for this"?. "How can I cure my son out of this".		

Contd.....

S.NO.	THEME	CONTENT	LESSON	TEACHING AIDS	ASSIGNMENT
			Ramu's mother explains that this is due to deficiency of Vitamin A in the diet. It is essential for eyesight. So you have to include adequate amount of vitamin A rich foods in Gopu's diet. Papaya, cabbage, carrot, cauliflower and green leafy vegetables contain good amount of vitamin A milk is also a good source of vitamin A. So better include all these vitamin A rich foods in Gopu's diet. From that day onwards Gopu's mother includes all vitamin A rich foods in Gopu's diet. Now Gopu is able to play even after 6 O'clock in the evening. Gopu has now get ridden of this night blindness.	Flash card story supply of Vitamin A tablets, Display of foods rich in vitamin A. Green leafy vegetables and milk.	Let pupils enact the story by becoming different characters and all the other children witness and enjoy the drama.
2.	Other vitamins and their importance.	Importance of other vitamins and their functions.	Vitamins are found in vegetables, cereals and fruits such as Vitamin A is needed for eye sight, vitamin B is good for healthy circulation of blood and vitamin D is good for healthy bones and teath.	Charts.	

Contd.....

S.NO.	THEME	CONTENT	LESSONS	TEACHING AIDS	ASSIGNMENT
3.	Addition and substraction	Importance of nutrients in fruits	Problems: 1. One guava contains 100 mg of vitamin C, an amla contains 38 mgm. of the same vitamin. If you eat a guava and one amla, how much of vitamin C do you get? 2. One guava costs 10 Ps. and one which amla costs 1 Ps. will give you more vitamin C per paise.	Problems chalk board.	Working out problems.

B. Carrying out Nutrition education programmes:

Carrying out nutrition education programmes is discussed under the following headings:

1. Including nutrition in the school curriculum
2. Conducting nutrition education activities.

1. Including nutrition in the school curriculum:

The investigator and the teachers took maximum efforts to utilise the class hours allotted for various subjects to give nutrition education to children. All the available opportunities, namely, physical education, citizenship training and celebrations like Pongal were also utilised for imparting nutrition education. Thus nutrition education was imparted for a period of six months starting from August, 1974 to January 1975. At the completion of each class, the children were given additional experiences through assignments, practical work and tests to facilitate evaluation.

2. Conducting nutrition education activities:

The following nutritional themes were chosen for conducting nutrition classes by the use of various methods.

a. Importance of vegetables and fruits in the diet
b. Importance of milk, egg, green and yellow vegetables, greens, papaya, carrot, tomato and goose berry.
c. Importance of protein-rich foods
d. Importance of school lunch and school garden

e. Vitamins and minerals in the diet

f. Concept of proper noun and common noun

g. Importance of 'Basic Five Groups'

h. How to combat deficiency conditions

i. Preservation of fruits and vegetables

j. Importance of vitamin A

k. Nutrition programmes

l. Importance of balanced diet

a. Importance of fruits and vegetables in the diet:

Use of flash card, display of food items and discussion were the methods used for this topic. Flash cards are a series of illustrated cards which when flashed in a proper sequence tell a complete story. In flash cards, people see the picture directly, instead of seeing it on a screen, (Reddy, 1971).

The experience varied from class to class according to interests and age. The first and second class pupils were exposed to various types of fruits and vegetables and they were asked to smell, taste and feel them. The third and fourth class students were given cut outs of vegetables and they were asked to assemble and name them. All the children enjoyed doing this challenging and interesting work shown in figure 4. The fifth standard children were given additional information as to the

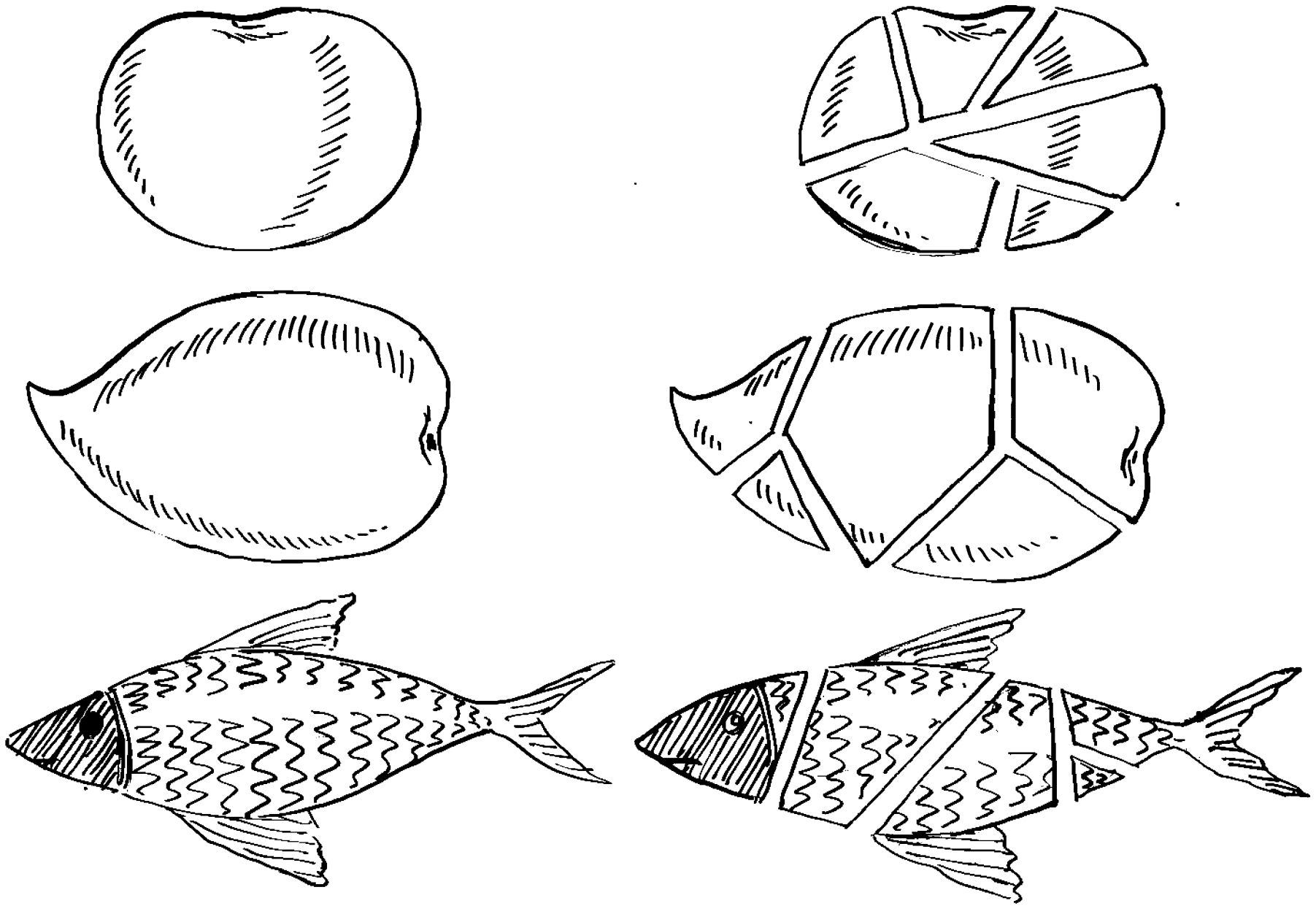


FIGURE 4 Samples of assignment on cut outs

nutrients present in fruits, how they should be cooked and consumed. A quiz was also administered to test their knowledge.

b. Importance of milk, green leafy and yellow vegetables, greens papaya, carrot, tomato and gooseberry:

'The protective foods' which are important for the growth of developing children was dealt with the help of action songs, direct purposeful experience and practical classes. (Figure 5). The action songs composed by the investigator are given in Appendix V. They were used for the first and second classes. Pictures of carrot, papaya, egg and few vegetables were drawn and tied to the body of the children as shown in Figure 6, and they dramatised explaining the functions (Appendix VI). As it was a dramatisation, it helped the children fully develop skills in observation, listening, imagination and speaking, (Goodwin, 1969). Children enjoyed by their cheers and songs. At the faces of the children were invisible, the situation created curious and challenging experiences for them. All the five classes witnessed the drama. They were all taught an action song, Appendix XII, which explained the functions of food. It was repeated by them even when they went for their practical work. Charts as seen in figure 7 on milk and milk products were utilised for class room education.

In addition, vegetables were given to them during the mid-day meals, reiterating their values. Posters were put up in the class-room and mid-day meals kitchen to pupils of their nutritive value and need for consumption.

Chart on milk, green and egg.

FIGURE-6

DRAMATIZATION ON VEGETABLES

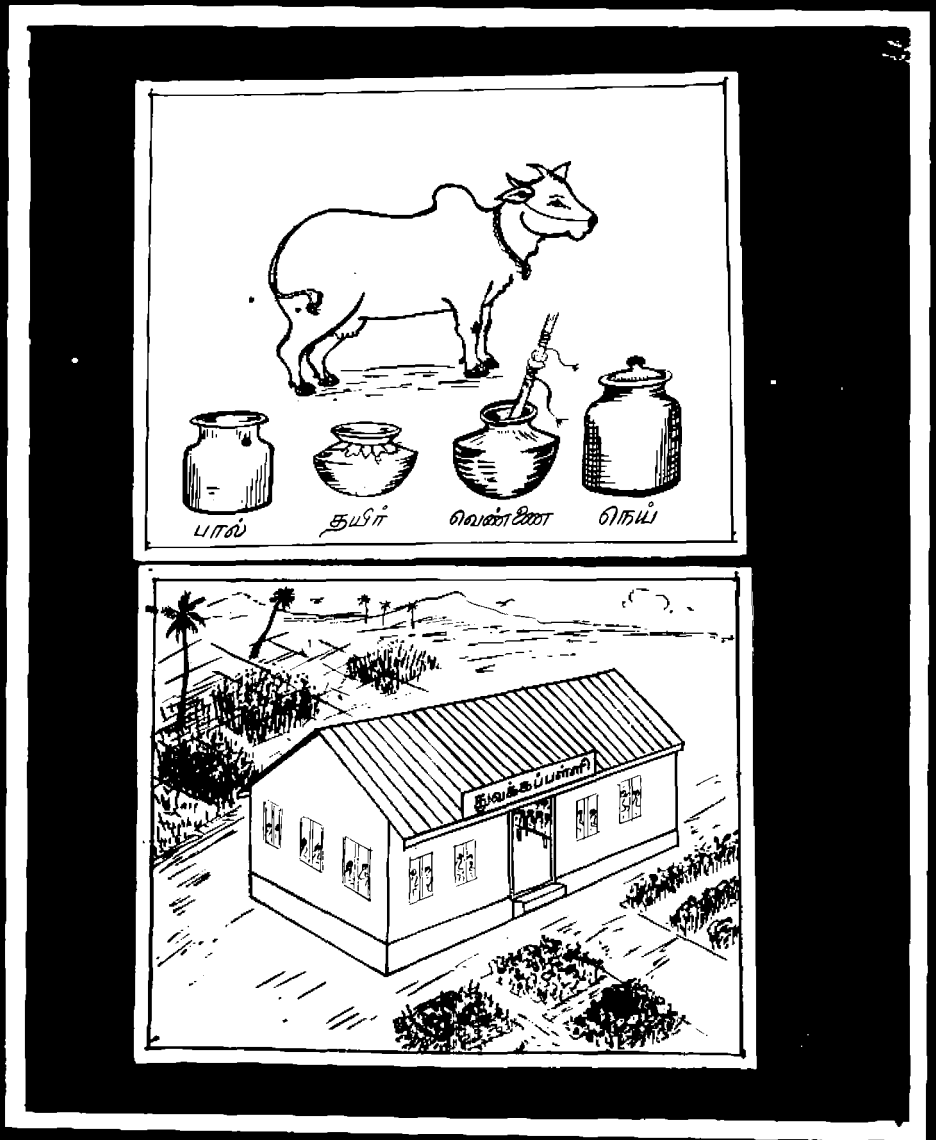


Fig. 7

Charts on milk and milk products used in class room education

A quiz, Appendix VIII, was administered to the children of the fifth standard in which questions like "which food is good for eyesight". "Tooth decay is caused by the lack of—" were posed to them and the groups who answered well were rewarded.

c. Importance of protein rich foods:

As special lecturer and guests to the school would add interest to school work, a special talk was arranged by the investigator to introduce this topic. Discussion and charts were used, and as an additional information, they were taken on a field trip to Sri Avinashilingam Home Science College wherein the protective food producing centres, poultry unit and dairy were present in one campus. The teachers also accompanied the pupils. A field trip was selected in order to impress the group about the feasibility and utility of a series of related practices (Reddy, 1971). It is natural that children enjoy outing and novel experience. Figure 8A and 8B show the pupils and teachers visiting the poultry and dairy units.

The children and teachers visited poultry unit and dairy, went round the college. The menu brought for the field trip group had been planned by the children themselves, including protective foods like sprouted green gram and tomato. They enjoyed the experiences and the evaluation test followed proved that the efforts

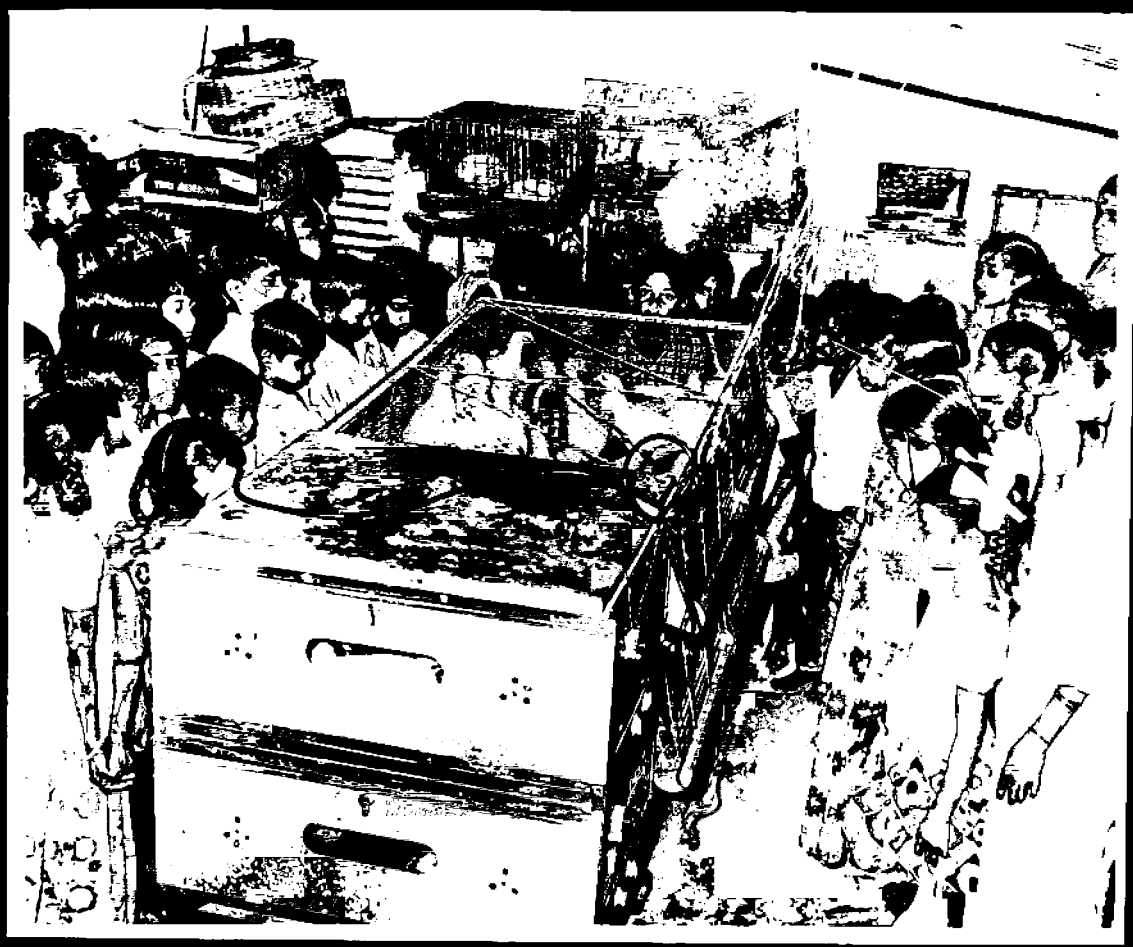


FIGURE - 8-A

FIELD TRIP - POULTRY UNIT

FIGURE 8-13

FIELD TRIP TO DAIRY FARM

had been successful. The model questions included for the test were like "One cup of milk contains --amount of vitamin A," "Butter is a good Source of---and so on.

d. Importance of school lunch and school garden:

The provision of snack or lunches in schools helps to, improving nutritional status of children as long as it provides those nutrients which may be in short supply or lacking in the family meals at home. (Gongora, 1974). To feed the children, good food, is a great task. The investigator was careful to include in the school lunch menu, the local low cost vegetables and fruits namely, raw tomato, watermelon and ladiesfinger. The school lunch is a great asset and a good venue for imparting nutrition education, as children are involved in the process of "eating".

Nutrition education was approached in an integrated way in which health habits were stressed. Prayer before meals, eating with out spilling, waiting for others and leaving the place neat and tidy where the health habits developed through regular exercise.

The school teacher could influence the children in maintaining school garden. The school garden would provide vegetable for their meals. The school garden takes the role of a demonstration

centre for both the pupil and the villagers. The school children prepare seed beds and grow nutritious vegetables and fruits, (Mathew, 1963)(Figure 9).

It is a novel and purposeful experience to put the knowledge learned into practice. Therefore the children were very eager to get involved in gardening. As the school was situated in a rocky place the investigator had to find a place for gardening. By the good will of one of the parents, the school authorities could sight a place for gardening. They generously gave one acre of the land and the investigator made maximum use of the opportunity by involving children in the gardening work, starting from the cleaning of the ground and planting. Gardening was a rich experience for the children to learn various types of plants, their growth, maintenance of garden, watering and utilising the produce. The children took turns to water the plants which they enjoyed. All the members concerned realised their role and importance in the endeavour.

Through the experience in agricultural production, the concept of self sufficiency was developed and it was stressed by initiating and starting kitchen gardens in the homes be accepted. For encouraging the homemakers, the investigator distributed vegetable seeds to the parents for making the kitchen garden in their homes. As the area for the school garden was offered by one of

FIGURE - 9

Children engaged in gardening work

the parents, all the parents came forward to help the school in their own mite for strengthening the school community relationship. A strong Parent Teacher Association was set up by enrolling 45 members and expressing to them the role of school towards community and their strong interrelationships. It was a good start to put in the forefront the various problems of the school to be solved by the parents. The plants sown in the garden were tomatoes, greens, and brinjal which are coming gloriously by the unstincted spirit and unwarranted enthusiasm of the children.

To the first, second and third standard children, sums were given with regard to school garden which is enclosed in lesson plan. Sums were given with regard to school garden eg to find out total produce of a school garden and were taken on a field trip to one of the local kitchen garden in the village. The fourth and fifth standard children were vigorously involved in planning the garden and clearing the ground for plants.

e. Vitamins and minerals in the diet:

Non-projected aids like charts and posters are visual symbols for summerising comparing, contrasting or performing other services in explaining subject matter, (Reddy, 1971). Charts of Applied Nutrition Programme prepared by Sri Avinashilingam Home Science College occupied an integral part of the display which were simple and attractive. (Figure 10). The foods rich in

FIGURE-10

CHARTS ON MINERALS AND VITAMINS USED IN CLASS ROOM EDUCATION.

minerals and vitamins were displayed in the exhibition. The first, second and third standard children were exposed to display samples, and posters. (Figure 11). In addition to these methods, colour slides on nutrients were shown by which all the children were impressed and came out with doubts marking the sign of better understanding and development in the subject matter. Slide is a transparent picture which is projected by focusing light through it from the electric bulb. Each slide can be retained for any length of time according to the teaching situation, (Reddy, 1971).

The fourth and fifth standard children were assigned with questions like "Carrot contains rich of ---". "Rickets is caused by the dificiency of ---". The answers were scored.

f. Concept of proper noun and common noun:

The words introduced also carried education on nutrition enabling students to imbibe the knowledge of nutrition through various angles.

The Alphabets namely were A for Apple, B for Beet root, C for carrot and so on and in addition, relevent pictures were represented. They were provided with crayon pencils and paper to draw the pictures and name them.

FIGURE - 11

A part of the exhibition put up at the Experimental School.

In addition to the above mentioned experience, the third, fourth and fifth standard students were given assignment of filling the blanks with relevant words namely "Mummy cuts the vegetables into ---", we grow --- in our school garden".

Common noun and proper noun also were introduced based on the nutritious foods. The investigator and the teacher taught the lesson step by step and asked them to repeat the words which were scored accordingly.

g. Importance of 'basic food groups':

Charts were prepared by the investigator indicating the Basic Five Food Groups which described the matter with colourful pictures to attract the attention of students. Charts were displayed, explained and the children acted as five food groups and enacted their role. Display of food item was done by Fourth and Fifth standard students themselves which was enjoyed by all the others. (Figure 12).

A Film on "Basic Five" was a novel additional information. Films often contain many visuals to command the viewers' attention. The film show is used because it has the ability to present facts in an interesting way and also to attract the audience, (Reddy, 1971 and Goodwin, 1969). Film show attracts not only children, but also adults and old people of village by which all could be approached easily and effectively. The first, second and third standard children enjoyed the display and film show and answered to the questions posed to them.

அடிப்படை ஐந்து

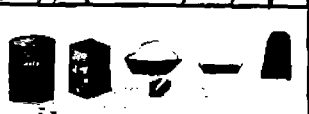
		அதில் உள்ள உணவுப்பொருட்கள்	சிறப்பு வைட்டமின்கள்
	1	மீன், இறைச்சி, முட்டை பருப்பு வகைகள் பால்	புரதம் ● நீர்ணநம்புச்சத்து ரைபோபிளேவின் (உயிர்ச்சத்து 'பி')
	2	பழங்கள் : ஆரஞ்சு, வாழைப்பழம், தக்காளி எலுமிச்சம்பழம், பப்பாளி, ஆப்பின் மாம்பழம் - கீரை வகைகள், முட்டைக்கோசு பூசல்	உயிர்ச்சத்து 'ஏ' உயிர்ச்சத்து 'சி' தாது உப்புக்கள் கிரும்புச் சத்து.
	3,	மற்ற காய்கறிகள் : கத்தரிக்காய், பாகற்காய், பரங்கி -காய், புடலங்காய், வெண்டைக்காய் முள்ளங்கி, சுரைக்காய்	உயிர்ச்சத்துக்கள் தாதுப்பொருட்கள்
	4	தானிய உணவுகள் : கோல் (அரிசி), கோதுமை, சோளம், கம்பு முதலியன நிலக்கடலை வகைகள் சேனை, சேம்பு, மரவள்ளி, உருளைகிழங்கு	மாவுச்சத்து புரதச்சத்து உயிர்ச்சத்து 'பி'
	5	எண்ணெய் வகைகள் தாவர எண்ணெய், நெய் வெண்ணெய் சர்க்கரை, வெல்லம்	கொழுப்புச்சத்து முக்கியமான கொழுப்புச் சத்துக்கள் உயிர்ச்சத்து 'ஏ' மாவுச்சத்து

FIGURE-12

Chart on Basic Five Food Groups
(Used in classroom education)

h. How to combat deficiency conditions:

One of the major causes for the high mortality and morbidity among infant and young children in our country is protein-Calorie-Malnutrition. Stunted growth, increased suceptability to infection, impaired learning and behaviour are some of the manifestations of malnutrition in childhood, (Devadas, et al, 1974). Realising crying problems of the hour the investigator and teachers touched the problem deeply through various audiovisual aids. A detailed simple discussion was given by a specialist in the field of nutrition, from Sri Avinashilingam Home Science College who made the matter easier, attractive and useful by demonstrating the deficiency cases through slides. The slide show was a great boon even to the teachers and other villagers who were astonished at the various types of diseases for which they were paying little heed. A heated discussion was initiated by asking children and parents what they liked and what they did not like, finding the reasons for the same and motivating them to include right type of food to have a balanced diet. As the slides were colourful, clear and attractive, the subject matter got registered in the minds of young and old.

There were deficiency cases of angular Stomatitis and anemia among the children themselves. The pediatrician from Sri Avinashilingam Home Science College located such cases during clinical check up and the investigator approached and adviced the parents for the remedial measures.

All the children and teachers had an interesting and challenging opportunity of visiting the Medical College Hospital and witnessing cases of marasmus and vitamin A deficiency to understand the scourge of problems realistically. They were very much impressed by these various types of experiences and decided to follow right type of food selection and preparation.

1. Preservation of fruits and vegetables:

It was approached in a coordinated way by educating the children and parents. The children were asked for the meaning of preservation and simple food preparations preserved in their homes. They were adviced to keep vegetables produced from the garden for the school lunch, for days together by demonstrating them through Janatha Refragerator. As it was a relevant, applicable and simple method, the parents also wanted to learn the same for their homes. (Figure 13).

A demonstration of 'Janatha Refregerator' was given in the presence of parents and children which was enjoyed utmost. All were impressed by its great value and owefulness and decided to implement the same. Now 80 per cent of the mothers of experimental school children are using this method for preserving the vegetables fresh. They were given practiced in preserving the vegetables by using the refregerator.

Figure-13

Demonstration of Janatha Refrigerat

j. Importance of vitamin A:

Vitamin A deficiency is the major cause of preventable blindness, in India. It is often related to weaning. The deficiency is commenest in children, age one to four years who live in socially, economically and hygienically deprived areas. It is estimated that one million cases of blindness is due to malnutrition in India, (Holmess, 1973). The most distressing problem of the world especially, our India, is the blindness. To educate the growing children on this important issue, which is the direct necessity of the hour, many audio-visual aids were included.

A set of flash cards were prepared by the investigator in a story form which explained the methods of preventing vitamin A deficiency and consecutively the blindness. (Appendix IX). As a natural phenomenom, children listened the story spell bound and repeated the same (Figure 14).

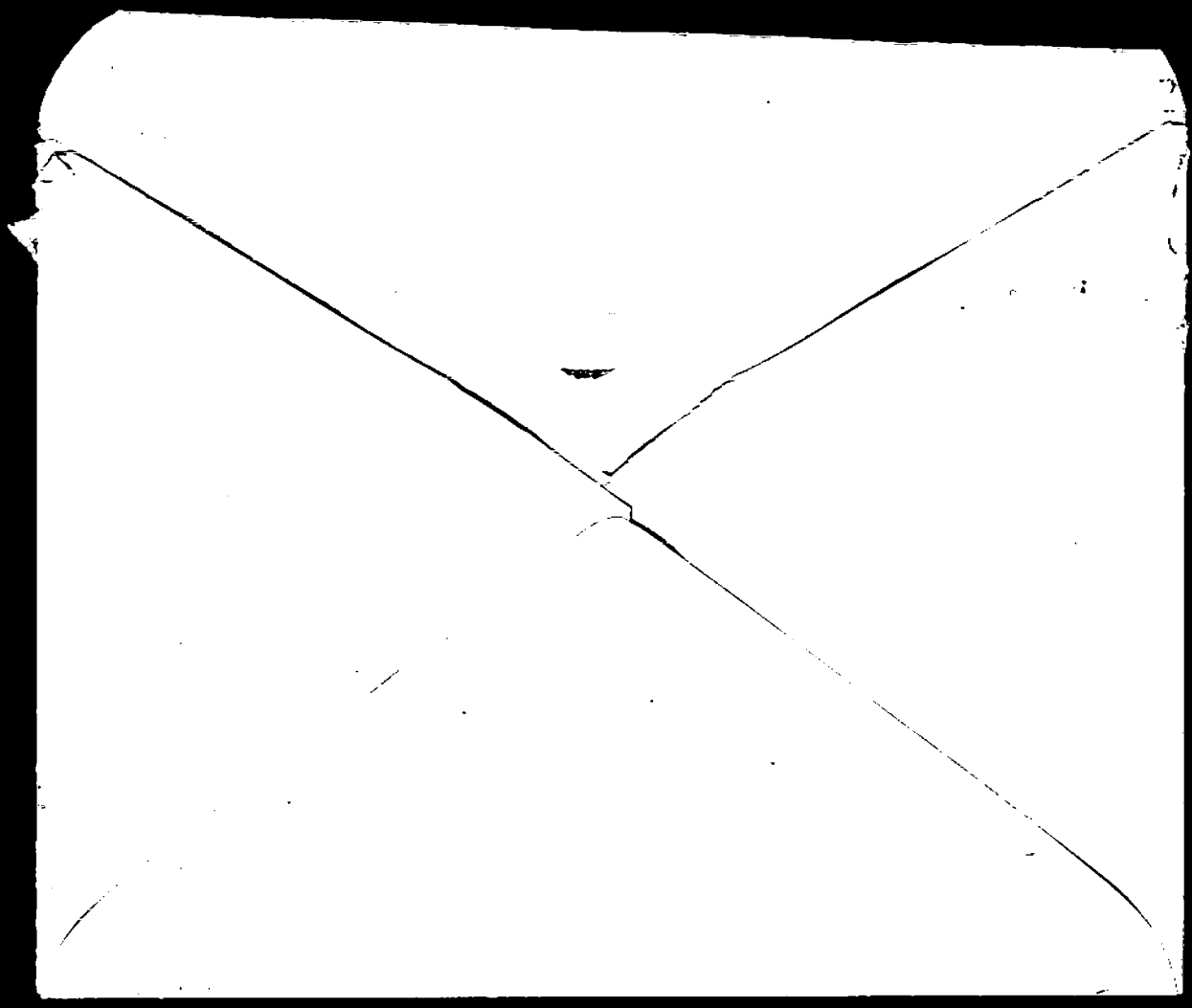
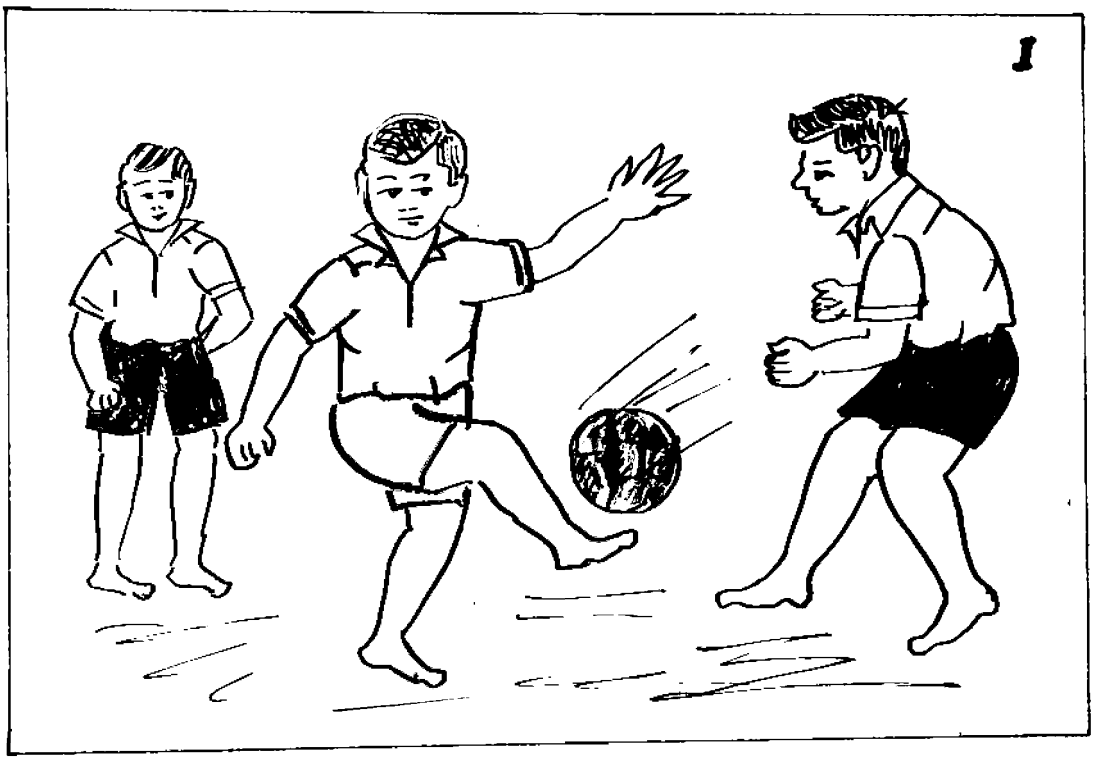


FIGURE - 14

A SET OF FLASH CARDS ON IMPORTANCE O

VITAMIN A USED FOR NUTRITION EDUCATION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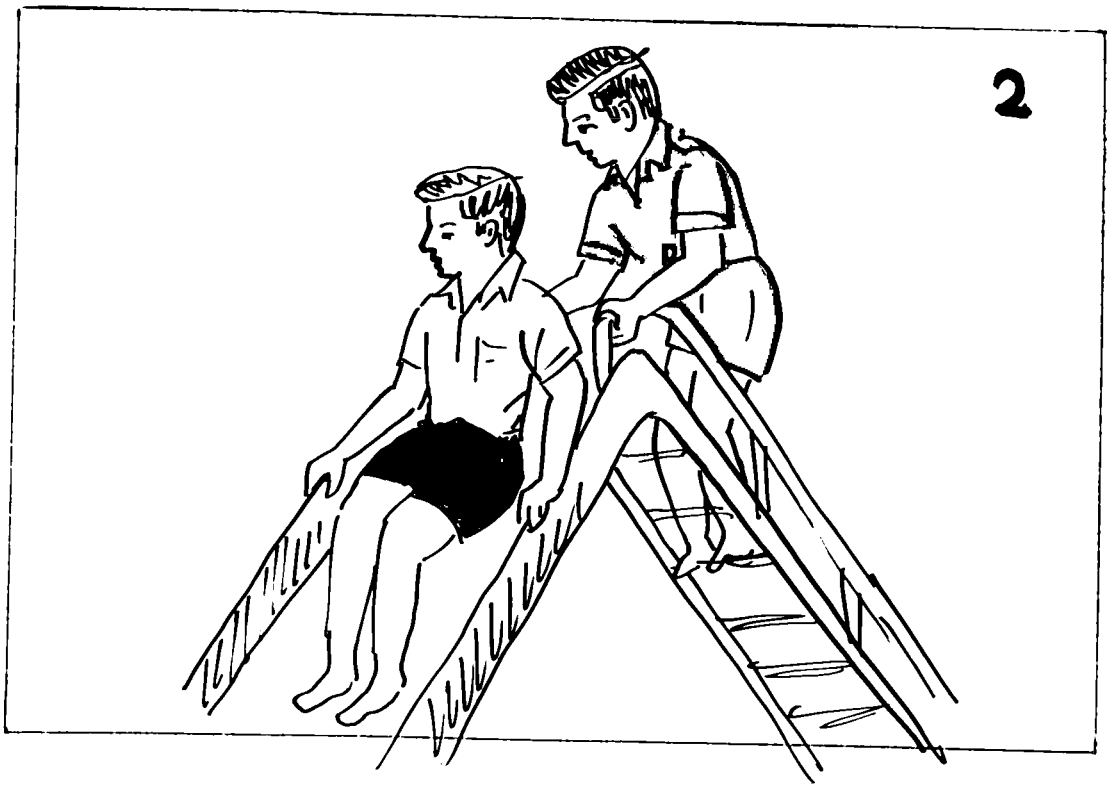
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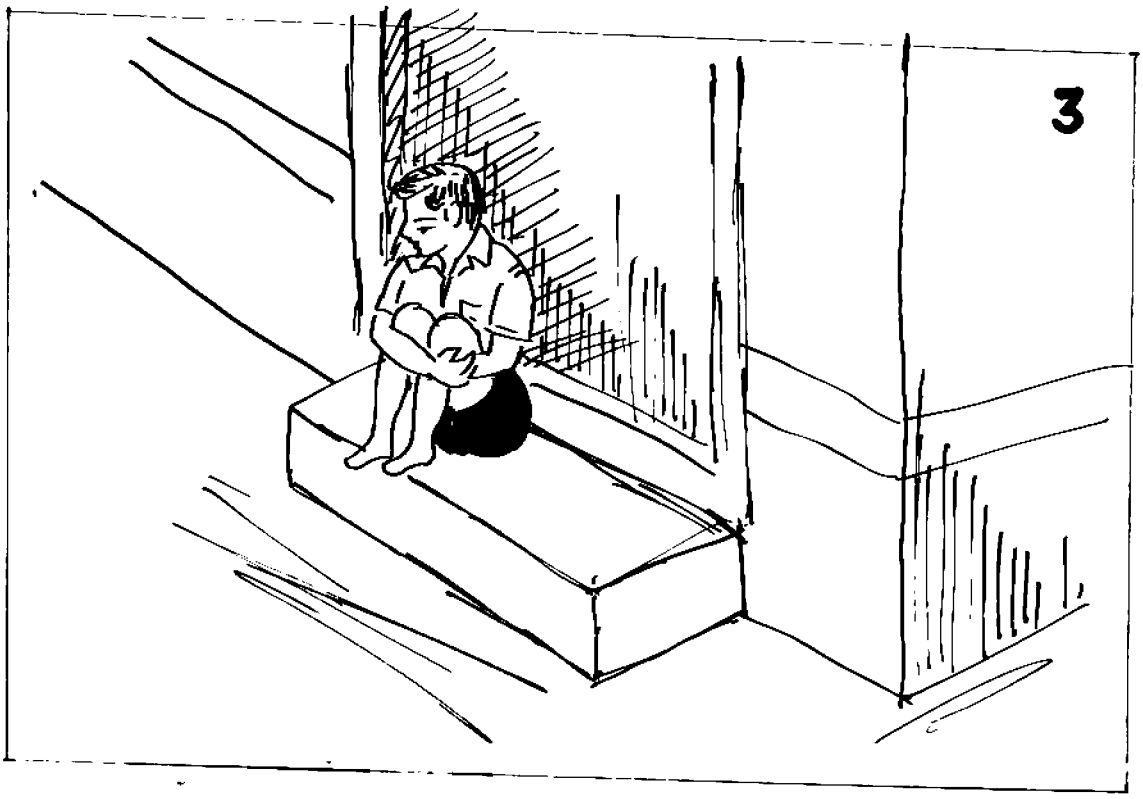
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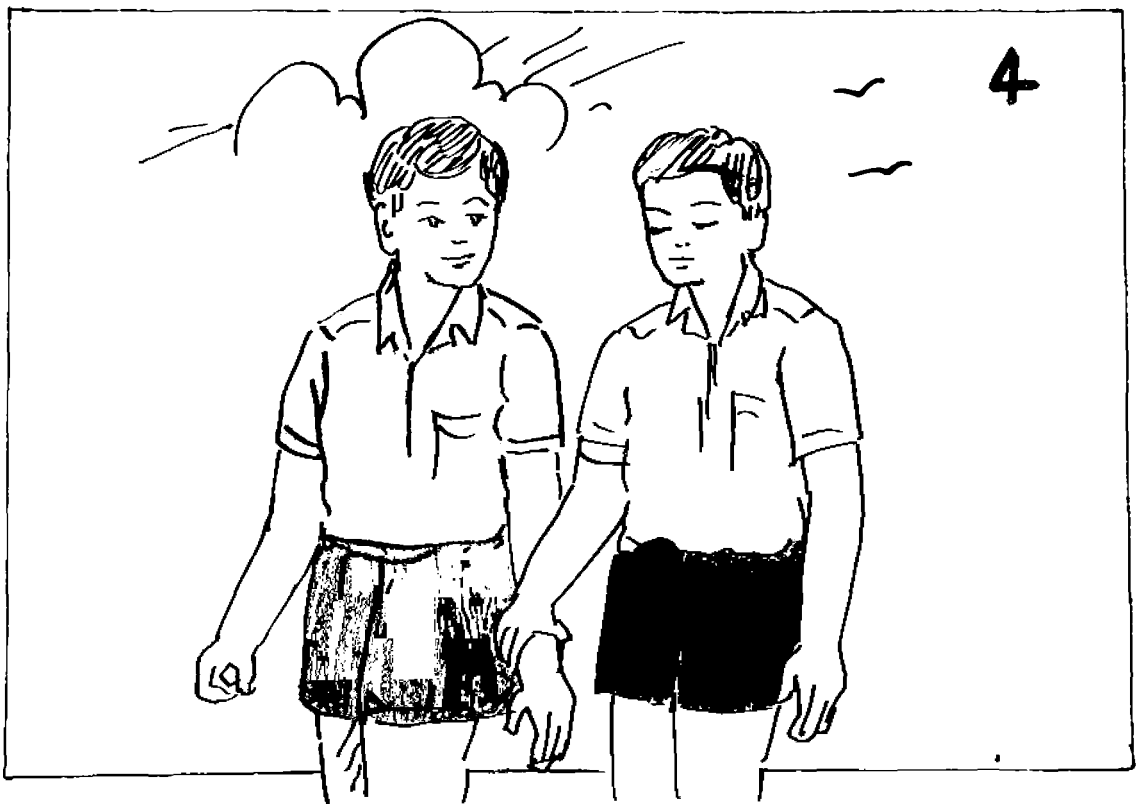
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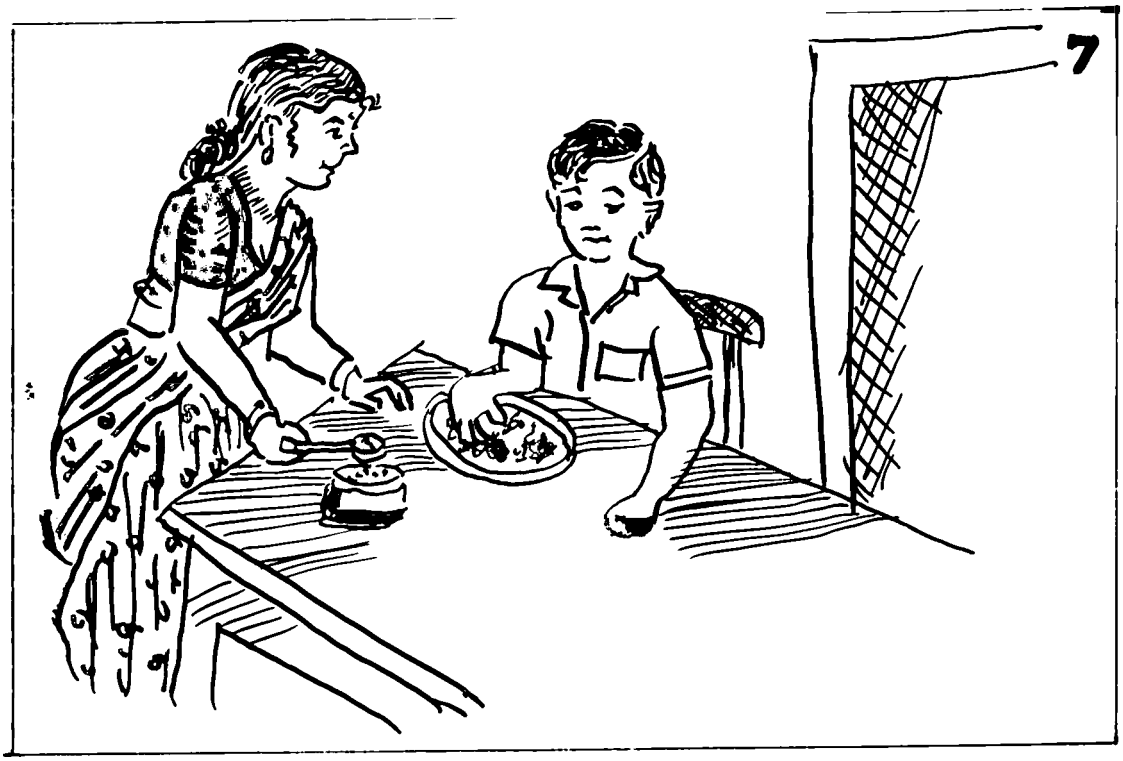
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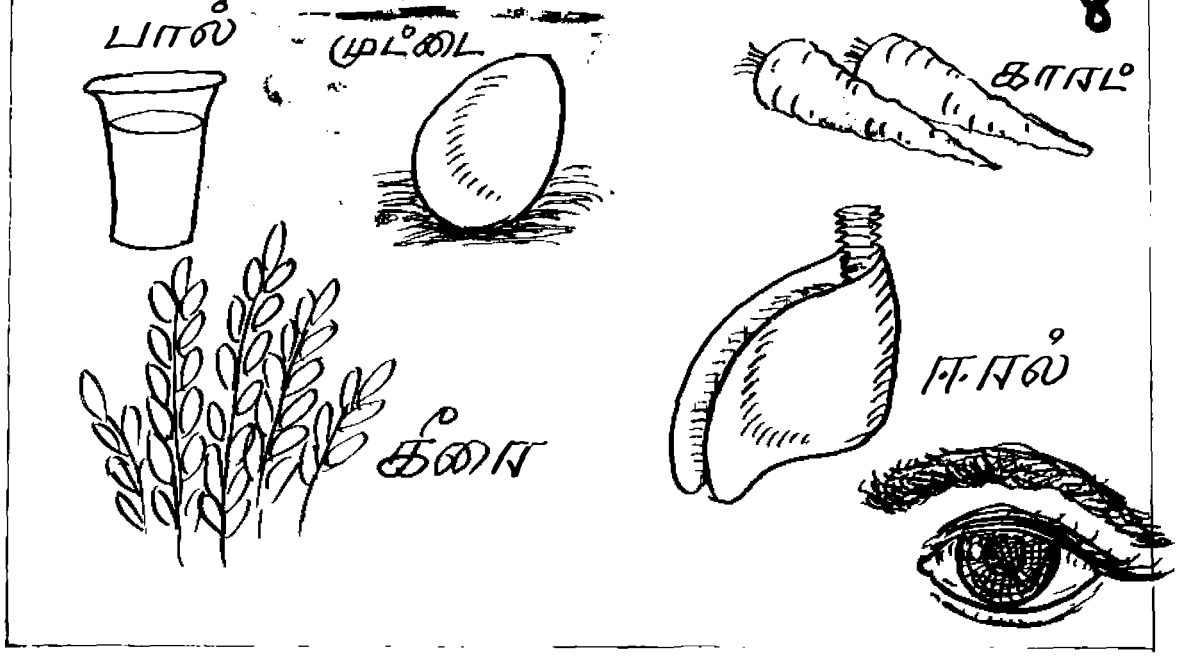
வைட்டமின் 'ஏ' சத்து நிறைந்த உணவுகள்.

8



வெட்டில் 'ஏ' ன் முக்கியத்துவம்

1. நண்பர்கள் இராமுவும், கோபுவும் மைதானத்தில் மகிழ்ச்சியாக விளையாடிக் கொண்டிருக்கின்றனர்.

2. இருவரும் மாலை நேரத்தில் விளையாடுகின்றனர்.

3. சிறிது நேரம் கழித்து கோபு சோர்வு அடைந்து உட்கார்ந்து கொள்கிறான்.

4. இதைக் கண்ட இராமு, கோபுவை வீட்டிற்கு அழைத்துச் செல்கின்றான்

5. மறுநாள் கோபுவின் அம்மாவும், இராமுவின் அம்மாவும் சந்திக்கின்றனர்.

6. இராமுவின் அம்மா, 'என் கோபு மாலையில் விளையாட முடியாமல் வீடு திரும்பி விட்டான்! என வினவ, கோபுவின் அம்மா 'கோபுவிற்கு மாலையில் கண் தெரியது இல்லை' என்ற கூறினான். உடனே இராமுவின் அம்மா, 'இது மாலைக்கண் நோய் ஆயிற்றே! உடனே தக்க வைத்தியம் செய்ய வேண்டும். கீரைகள், காய்கனிகளும், கேரட்டும் உணவில் சேர்த்துக் கொடுக்க வேண்டும். கீரைகள் என்ற கூறினான்.

7. இதைக் கேட்ட கோபுவின் அம்மா, கோபுவிற்கு தினமும் கீரை வகைகள் காய்கறிகள், கேரட் ஆகிய வைட்டமின் 'ஏ' நிறைந்த உணவுகளைக் கொடுத்து வருகிறாள். அதனால் கோபுவின் மாலைக் கண் நோய் விரைவில் குணமாகியது.

Flash cards are a series of illustrated cards which when flashed or presented (before a group) in proper sequence to tell a complete story. In flash cards, people see the picture directly, instead of seeing on a screen. The story is simple and tells about one theme (Reddy, 1971).

The third and fourth standard children gave a "Role play" performance in which they acted like papaya, carrot, greens, and tomato. They did their role effectively and in a simple manner to facilitate the understanding of the youngest in the group.

Films on vitamin A deficiency envisaged a fund of information, by which parents and children learned the proper foods to be consumed in the diet to get away such situation. The first and second class children also enacted in a drama by appearing as vitamin A rich foods. Display samples were brought and arranged by the third class students.

The health personnel from the Primary Health Centre came for the eye check up and destributed vitamin A tablets to the children as a preventive measure. In addition they were enlightened at this juncture about eye sore, cholera and other communicable diseases which could be ridden away by proper protective nutritious foods.

k. Nutrition programme:

This theme was mainly dealt for the parents to enable them to learn the various agencies and organisations striving for their

better health status among the people. It was quite enlightening to them to see the film explaining that "ragi is the best food" "Greens are to be included daily" for which they were ashamed of to include in the diet. It was a real eye opener to the people to see the various simple nutritious foods, proper methods of food preparation, practicable health habits and various measures taken by the Government to alleviate malnutrition through various programmes like, Applied Nutrition Programme, Midday-Meal-Programme and Balwadi education and the parents realised their great role in them. In due course, the parents started paying greater attention to midday-meal scheme and offered extra vegetables grown in their garden. It was a good sign of achievement for the investigator which was well appreciated by the local leaders and head mistress.

Films on "Balance Diet", "Midday meal Programme", "Foods for thought", "Food facts", "ANP" were screened for additional information.

1. Importance of balanced diet:

A balanced diet can be formulated by providing sufficient amounts of all the foods from the different food groups in order to provide all the nutrients in the amounts prescribed for a day, (Clarence, 1974).

The concept of balanced diet was being stressed in every subject dealt and the children were made conscious of the value

of different foodstuffs. When the children were saked for their opinions by showing various pictures with malnourished and well nourished children, they could identify the well fed ones (Figure 15). Charts on balanced diet were put up on the bulletin board to reiterate the concept. For the second, third and fourth standard children, display of balanced food assignment was given and they explained the matter to all the children. This created a new inspiration among them to do their work effectively.

The exhibition was put up on "Balanced diet" was a great boon to the parents and children facilitating them to 'learn by doing'. Exhibition is one of the best programmes in education, in exhibition we show the actual things, practices, results of demonstrations, programmes in progress, through-charts, diagrams, displays, layouts, models etc. (Dahama, 1968).

Children were organised into groups for various parts of the exhibition. The simple clay models of fruits and vegetables were prepared by the First and Second standard children and third and fourth standard children helped inthe put of the charts and posters and prepared models of poultry and kitchen garden and dairy. They enjoyed the duties and worked well in groups. The parents came out with samples of display and helped in the arrangements. The entire village visited the exhibition and acquired information on balanced diet, better health habits (Figure 16) environmental hygiene and prevention of communicable disease (Appendix X).

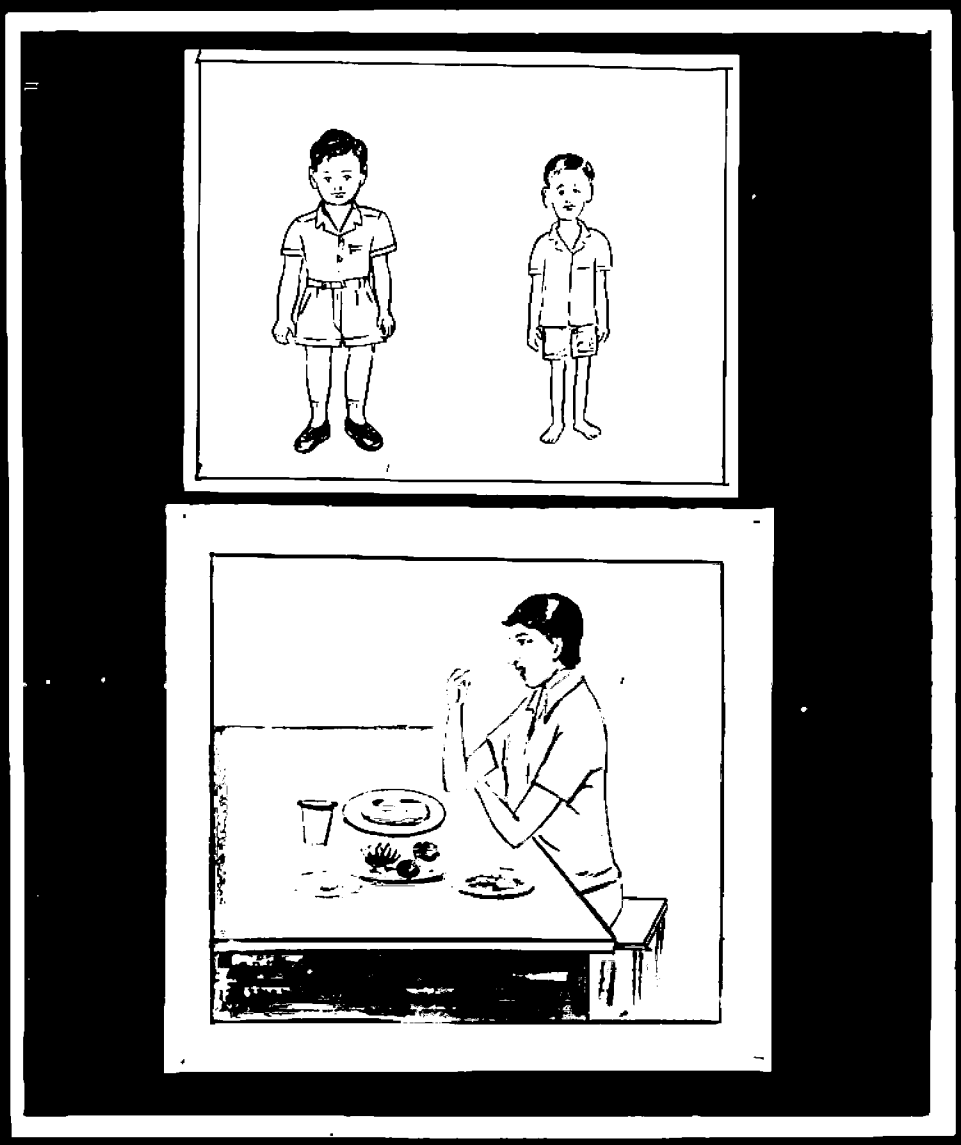


FIGURE - 15

Chart on "Importance of Balanced Diet"

FIGURE·16

Development of proper eating habits among children

The subject matter on "Happy family" was dealt by showing a picture of "Happy family". The discussion was directed towards knowing the number of member in the individual families of children. The fourth and fifth standard children could very well comprehended and tell the slogan of Family Planning, "Small families are happier families". It was felt by the children themselves, that when there are few members they are fed well and variety of foods was available. (Figure 17).

All the children were exposed to a simple story on Happy family, which was duly repeated by the children. A test was also administered for evaluation.

The films from Field Publicity office and Public Relation's Office were screened to the public and at the parent Teacher Association, a special lecture was given by the Mass Education Officer, who enlightened them on planned family living.

In addition to the regular syllabus headings, extra experiences were provided to the parents and children namely during physical education hour, the mass drill for boys, kummi for girls were organised with a song (Appendix XI) on nutrition which emphasised healthy habits, choice of nutritious foods and proper eating habit.

The parent Teacher Association meetings were of great help to the investigator in imparting nutrition education to them. The parents were exposed to the folk methods like songs

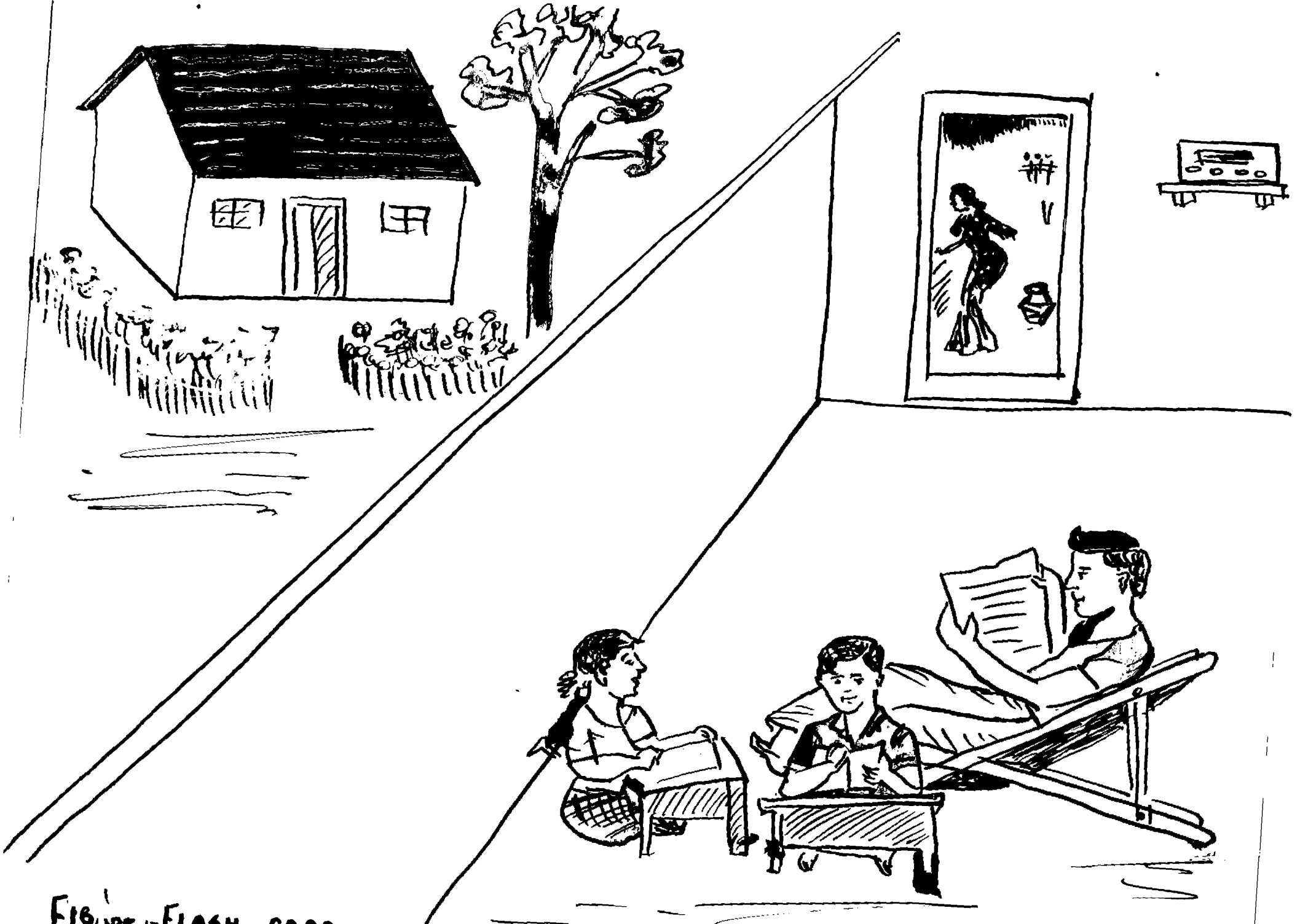


FIGURE 17. FLASH CARD ON 'A HAPPY FAMILY'.

kummi and villupattu (Figure 18) and they benefitted much out of the exhibition, public meetings and filmshow. The mothers were exposed to the mahalir manram meetings and activities in which alround development programmes were carried out (Figure 19).

The important National festivals like Independence day, Republic Day, and Children's Day were also celebrated by inviting the parents to witness the interesting and novel programmes of children thus strengthening the school community relationship.

Children were developed in special skills like singing, dancing, enacting, developing programmes and organising ability and many leaders could be located and utilised for better functioning of the school.

FIGURE - 18

Nutrition Education through folk methods

FIGURE - 19

Discussion at Parent Teacher Association meeting

C. Evaluating the impact of nutrition education programmes:

Evaluation is the determination of the value, strength or worth of something, an appraisal, an estimate of the force or of making of a judgement of something. The impact of nutrition education programme was evaluated in the following lines:

1. Participation of children and mothers of experimental school in the nutrition education programme
2. Effect of nutrition education on experimental school children conducted through integrated curriculum
3. Details of dietary practices of mothers of both experimental and control group children before and after nutrition education
4. Opinions of mothers and children of experimental schools group about the methods used for imparting nutrition education

and 5. Assessment of height, weight and clinical assessment of experimental and control school children.

1. Participation of children and mothers of experimental school in the nutrition education programme:

The success of the educational programmes was determined by the regular participation of parents and children. Therefore attendance of parents for various programmes of the children in the school was maintained. Nutrition education imparted to children was evaluated through tests and quiz programmes.

2. Effect of nutrition education in experimental school children conducted through integrated curriculum:

Education is the most powerful and effective instrument for introducing radical changes in the behaviour of man, Patrick (1974

It is a continuous process that goes from one's infancy till death. It depends the life of every individual so that it may acquire new dimensions. Knowledge is the prerequisite for adoption of fundamental to any behavioural changes. After the conduct of every class on nutrition, the children of the five selected class, were evaluated for their receptive ability and performance through tests, questionnaire, dictation, fill in the blanks test, matching the words, recitation, quiz, dramatisation and story telling. Scores were given for children for the individual tests. The average of the percentage scores given for various tests on particular topic for a particular class was taken for discussion. The details of the scores given for the individual tests for the individual class is given in Appendix XII A,B,C,D and E.

3. Details of dietary practices of mothers of both experimental and control Group: children before and after nutrition education:

An attempt was made to find out the change in the nutritional knowledge of mothers. An interview schedule was prepared administered to understand the dietary practices of mother both experimental and control group children. The initial and final results were compared.

4. Opinions of mothers and pupils of experimental schools group about the methods used for imparting nutrition education:

The eleven topics incorporated in the integrated curriculum lesson were dealt through various audiovisual aids. The topics

taken for educating mothers also included various types of audio-visual aids for simplification and clarity of purposes. The methods liked by mothers and children of experimental school assessed for future course of action.

5. Assessment of height, weight and clinical assessment of experimental and control group pupils:

The heights and weights of experimental and control school pupils were taken by the investigator and the pediatrician from Sri Avinashilingam Home Science College performed the clinical assessment before and after nutrition education. As SubraCan (1973) states that the methodology of assessment for nutritional status is varied. It includes clinical diognosis, anthropometric measurements, biochemical determinations and dietary evaluation. The initial and final results were compared for the effectiveness of Nutrition education imparted to them.

The results of the evaluation through various methods in various angles are discussed in subsequent chapter.

IV RESULTS AND DISCUSSION

The results of the study on "Exploring the possibilities of utilising a rural school for the promotion of nutrition consiousness" are presented and discussed under the following headings.

A. Participation of pupils and mothers of experimental school group in nutrition education programme

B. Effect of nutrition education on experimental school pupils conducted through integreted curriculum

C. Details of dietary practices of mothers of both experimental and control group pupils before and after nutrition education

D. Opinions of mothers and pupils of experimental school group about the methods used for imparting nutrition education

E. Assessment of height and weight and clinical assessment conducted for experimental and control school pupils before and after nutrition education

and F. Evaluation of nutrition knowledge of pupils and mothers in the experimental and control groups before and after nutrition education.

A. Participation of children and mothers in nutrition education programme:

Table VIII explains the attendance of experimental school children in the various classes.

TABLE VIII

PARTICIPATION OF EXPERIMENTAL SCHOOL PUPILS IN THE CONDUCT OF VARIOUS LESSONS

Number of samples : 140

S.No.	Topics dealt	Percentage of children attending				
		Istd.	IIStd.	IIIStd.	IVstd.	Vstd.
1.	Importance of Fresh vegetables and fruits in the diet.	70	100	90	80	70
2.	Importance of yellow, green leafy vegetables	50	70	80	75	80
3.	Importance of protein rich foods	20	40	60	70	80
4.	Vitamins and minerals in the diet	40	50	70	80	100
5.	Importance of school lunch and school garden	-	-	80	90	50
6.	Concept of proper noun and common noun	40	90	70	65	80
7.	Importance of basic five food groups	100	100	90	80	100
8.	Preservation of fruits and vegetables	80	100	80	90	85
9.	Importance of vitaminA	100	100	100	100	100
10.	Nutrition programme	100	100	100	90	100
11.	Importance of balanced diet	100	90	90	100	90
12.	The subject matter on "Happy family"	100	90	80	100	100

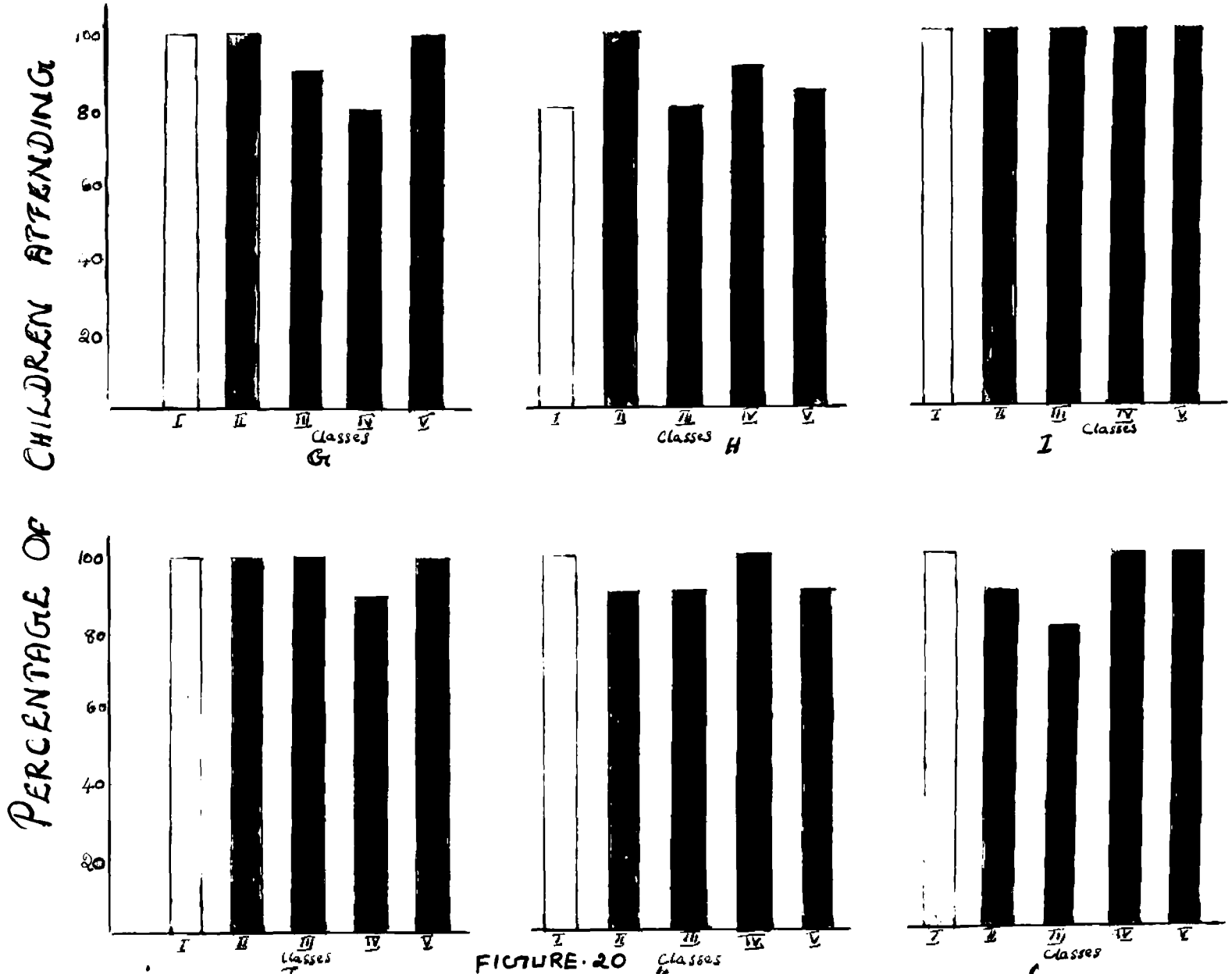
Classes on importance of basic food groups, preservation of fruits and vegetables, importance of vitamin A, nutrition programmes, balanced diet, use of fresh vegetables and fruits and happy family had full attendance of children pointing out the method adopted for these topics namely flash cards, filmshow, method demonstration and slide show which could be utilised more for other topics to make the students attentive and easily imbibe the habits and practices. It is also evinced that the attendance of students of III, IV and V standard was more encouraging during all the classes indicating their sense of responsibility and regularity (Figure 20).

The extent of participation of mothers of experimental group children is depicted in Table IX.

Percentage of children attending
20
40
60
80
100
A
Classes
I
II
III
IV
V
B
C
D
E
F
Scale
½" ..... 20 percent

FIGURE. 20

Scale
"
½ .... 20 per cent



FIGURE·20

:Extent of participation of experimental school children in the conduct of various lessons.

KEY:

TOPICS

A. IMPORTANCE OF FRESH VEGETABLES AND FRUITS IN THE DIET

B. IMPORTANCE OF YELLOW,GREEN LEAFY VEGETABLES

C. IMPORTANCE OF PROTEIN RICH FOODS

D. VITAMINS AND MINERALS IN THE DIET

E. IMPORTANCE OF SCHOOL LUNCH AND SCHOOL GARDEN

F. CONCEPT OF PROPER NOUN AND COMMON NOUN

G. IMPORTANCE OF BASIC FIVE FOOD GROUPS

H. PRESERVATION OF FRUITS AND VEGETABLES

I. IMPORTANCE OF VITAMIN A

J. NUTRITION PROGRAMME

K. IMPORTANCE OF BALANCED DIET

L. THE SUBJECT MATTER ON HAPPY FAMILY

TABLE IX

ATTENDANCE OF MOTHERS OF EXPERIMENTAL GROUP PUPILS IN THE VARIOUS PROGRAMMES

Number of samples: 90

S.No.	Programmes	Response of the mothers	
		Number	Percentage
1.	Importance of taking raw vegetables and fruits	88	97
2.	Nutrition leads to better health	86	95
3.	Nutrients and their functions	86	95
4.	Kitchen gardening	85	94
5.	Principles of cooking	80	89
6.	Care of children and care of health	80	89
7.	Various deficiency diseases	80	89
8.	Importance of food for health	72	80
9.	Meal planning	70	77
10.	Explanation of balanceddiet	50	55
11.	Storage and preservation of foods	50	55
12.	Demonstration on Hay box	40	44

It is revealed that there was maximum participation (89-97%) of mothers in the classes on importance of raw vegetables

and fruits in the diet, nutrition leading to better health, nutrients, their function and deficiencies, kitchen gardening and principles of cooking. It is interesting to see that those topics dealth by use of various types of audio-visual aids namely exhibition, demonstrations and fieldtrip, had maximum attendance. Even other topics had participation of 44-77 per cent of mothers indicating the deep interest of home makers in acquiring the knowledge of nutrition.

B. Effect of nutrition education on experimental school children conducted through integrated curriculum:

After the conduct of various classes, the investigator, administered various types of tests to evaluate, the acceptance of ideas.

The tools used for testing the knowledge of children after the conduct of the class were quiz, mental sums, filling up blanks, dictation, assignment, story telling, recitation, exercise, tests, signing competition and drama. The average of the scores obtained in various types of tests on various topics were calculated for each class and percentage of the scores obtained by the each class is depicted in Table X.

TABLE X

AVERAGE OF THE PERCENTAGE SCORES OBTAINED BY THE EXPERIMENTAL SCHOOL PUPILS IN VARIOUS CLASSES

S.No.	Topics dealt	Percentage of scores obtained by children in various classes									
		I Std.		II Std.		III Std.		IV Std.		V Std.	
		B.N.	A.N.	B.N.	A.N.	B.N.	A.N.	B.N.	A.N.	B.N.	A.N.
1.	Importance of fresh vegetables and fruits in the diet	10	32	15	38	20	42	25	48	30	50
2.	Importance of protein rich foods.	15	38	18	40	22	45	29	50	32	54
3.	Importance of yellow, green leafy vegetables	16	40	20	43	24	49	31	52	34	58
4.	Vitamins and minerals in the diet	18	41	24	47	27	52	33	58	36	61
5.	Importance of school lunch and school garden	20	45	28	49	28	54	34	60	38	64
6.	Concept of proper noun and common noun	22	50	32	51	30	57	38	62	40	67
7.	Importance of Basic Five food groups	24	52	35	53	33	60	40	64	42	69

B.N. - Before Nutrition Education
A.N. - After Nutrition Education

Contd.....

S.No.	Topics dealt	Percentage of scores obtained by children in various classes									
		I Std.		II Std.		III Std.		IV Std.		V Std.	
		B.N.	A.N.	B.N.	A.N.	B.N.	A.N	B.N.	A.N.	B.N.	A.N.
8.	Preservation of fruits and vegetables	26	54	39	55	35	63	43	68	45	72
9.	Importance of Vitamin A	28	58	43	57	38	65	46	70	47	77
10.	Nutritional programmes	30	62	45	59	40	69	48	73	49	79
11.	Importance of balanced diet	32	66	48	61	42	72	51	75	51	83
12.	The subject matter on "Happy family".	34	70	50	63	44	78	53	77	53	88

B.N. - Before Nutrition Education
A.N. - After Nutrition Education

As the lessons advanced, it was seen that there was increase in average of the percentage scores obtained by children of all the classes. It is also evinced that average percentage scores obtained by children of III, IV and V class children on the topics, Importance of vitamin-A, balanced diet and deficiency disease was high indicating their better understanding and comprehension ability. The high scores can be attributed due to interesting methods adopted for explaining the lesson, namely, slide show, exhibition and flash cards. The table evinces the positive influence of nutrition education on the children.

C. Details of dietary practices of mothers of both experimental and control group children:

The preliminary survey revealed that 55 percent of the homemakers in the experimental village and 43 per cent of the homemakers in the control village, were doing "meal planning".

Eighty percent of the homemakers in the experimental group who participated in the nutrition education programme had adopted meal planning whereas in Kolathupalayam, the control village, only 50 per cent of the homemakers were planning their menu.

The reasons expressed were to save time and complete the task quickly and efficiently. The reasons for other members for not planning ahead the menu was lack of interest.

2. Methods of cooking:

For preparing cereals and pulses, boiling method was used by 100 per cent of the home makers in both experimental and control village. Stewing methods were used for preparing fish and meat by 80 per cent of members both in experimental and control villages. Fruits were used in raw form by 71 per cent of the home makers in experimental village and 28 per cent of homemakers in control village. After nutrition education, it was found that 60 per cent of homemakers were cooking the rice by absorption method, 40 per cent of mothers were cooking vegetables with enough water without draining the water and spoiling the nutrients.

3. Methods of preservation:

Fiftyfour per cent of mothers in experimental village and 63 per cent of mothers in the control village preserved lime, amla and mango by pickling. The period for which the pickles were preserved varied from one month to one year.

After Nutrition education, it was found that 75 per cent of the mothers of experimental school children adopted improved methods of preserving foods by dehydration, salting and jam making. In the case of control school, there was no evident change in the preservation practices.

4. Foods given under special conditions:

Table XI denotes the foods given under special conditions.

TABLE XI

FOODS GIVEN UNDER SPECIAL CONDITIONS

S.No.	Special conditions	Food items given	Percentage of families responding			
			Experimental		Control	
			Before	After	Before	After
1.	Infancy	Breast milk	90	95	95	100
		Cows milk	20	25	48	42
		Biscuit	30	35	24	25
		Mashed rice	20	20	17	8
		Kanji	18	4	7	10
		Amul	2	4	2	3
		Fruit juice	10	12	12	12
2.	Preschool	All foods	64	58	93	93
		Fruit	16	18	4	4
		Milk	17	18	4	5
		Egg	3	6	4	4
3.	School going	All foods	62	50	76	78
		Fleshy foods	15	20	18	19
		Milk	23	30	6	6
4.	Pregnancy	All foods	66	58	93	90
		Except mango	11	12	2	2
		Greenpapaya	8	9	8	8
		Green leafy vegetables	3	5	11	12
		Fruits	8	10	12	14
		Milk	4	6	11	12
5.	Lactation	All foods	84	83	93	93
		Except mango	11	22	4	4
		Milk and Fruit	4	14	7	8
		Greenleafy vegetables	3	20	11	10
		Ragi preparation	2	30	2	4

Contd....

S.No.	Special conditions	Food items given	Percentage of families responding			
			Experimental		Control	
			Before	After	Before	After
6.	Old age	All foods	86	88	85	84
		Soft foods	64	100	80	81
	Disease					
7.	Fever	Milk	5	20	17	17
		Orange	35	40	33	34
		Coffee	30	20	20	20
		Bun	8	10	17	15
		Kanji	4	2	13	14
		Barley water	2	7	-	-
		No answer	16	1	-	-
8.	Small pox	Fruits	4	35	21	21
		Curds	46	38	30	32
		Curd rice	25	14	42	40
		Barley water	18	3	7	7
		No answer	7	-	-	-
9.	Dysentry	Butter milk	68	69	35	35
		Rasam	2	4	24	23
		Kanji	8	13	19	20
		Strong tea	9	14	12	10
		No answer	13	-	10	2
10.	Cold and cough	Kanji	32	33	28	28
		Rasam	45	48	23	24
		Orange	3	13	24	26
		Barley water	2	6	15	17
		No answer	18	-	10	5

Nutrition education had increased the knowledge of the mothers by adding leafy vegetables, milk and fruits during infancy and preschool, including furits, pulses and vegetables in times of pregnancy and lactation. In all the other conditions, there was no radical change mentioned before and after nutrition education.

5. Daily meal pattern:

Details about daily meal pattern is given in the following table.

TABLE XII

DAILY MEAL PATTERN

S.No.	Meals	Food items included	Percentage of families preparing	
			Experimental	Control
1.	Break fast	1. Dosai with chutney or sambar / Idli with chutney or sambar	30	21
		2. Rice with sambar	21	13
		3. With vegetable kolambu	30	26
		4. Ragi or maize	10	40
		5. Uppuma with chutney	9	--
2.	Lunch	1. Left over food from breakfast	24	40
		2. Ragi or maize	14	38
		3. Rice with rasam	11	6
		4. Rice with vegetable kootu	14	6
		5. Rice with chutney	32	10
3.	Tea	1. Left over food	48	7
		2. Coffee	41	55
		3. Tea	--	25
		4. Uppuma	7	1
		5. Tapioca	4	9
		6. Nil	--	3

Contd....

S.No.	Meals	Food items included	Percentage of families preparing	
			Experimental	Control
4.	Dinner	1. Rice	52	74
		2. Maize or Ragi with kolambu or sambar	30	10
		3. With vegetable curry	8	5
		4. Dosai	6	4
		5. Uppuma	4	7

The table denotes that a majority, 52 per cent of the families in the case of experimental village and 74 per cent in the control village were using rice for their meals. It could also be seen that ragi and cholam which were produced locally were also part of their meals.

After nutrition education it was found that more than 50 per cent of the homemakers in the experimental school had included nutritions foods such as ragi adai, ragi leaf cake, papali adai, groundnut toffee, maize or cholam with green leafy vegetables, mixed cereals and pulses in their breakfast. Potato chips, ragi murukku, ragi balls, wheat pittu and chapatis were included frequently during tea by 20 per cent of the experimental group mothers and occasionally by 25 per cent of mothers. Nutrition education had helped them to include these low cost nutritious recipes in their daily diet.

Mothers' participation in the school:

Sixty out of 90 mothers in the experimental school and 40 out of 90 members in the control school stated that there was a Parent Teacher Association. But after nutrition education it is encouraging to find that 100 per cent of homemakers had realised the existency. This revealed that the mothers were very regular in attending Parent Teacher Association meetings.

The items discussed during the Parent Teacher Association were the children's school programme, about the school building and the attendance of children in the school. Parent Teacher Association meetings were held twice a month.

In the case of control school the Parent Teacher Association meetings were conducted once in a month. Only 40 mothers attended the meetings. After nutrition education it was found that the mothers of the experimental group, were participating in the film show, slide show, exhibition, drama and songs conducted for children and cooking demonstrations conducted for them. New recipes like papali adai, tomato jam, ragi balls and vegetable pickles were demonstrated to them. (Appendix XIII).

D. Opinions of mothers and pupils of experimental school groups about the methods used for imparting nutrition education:

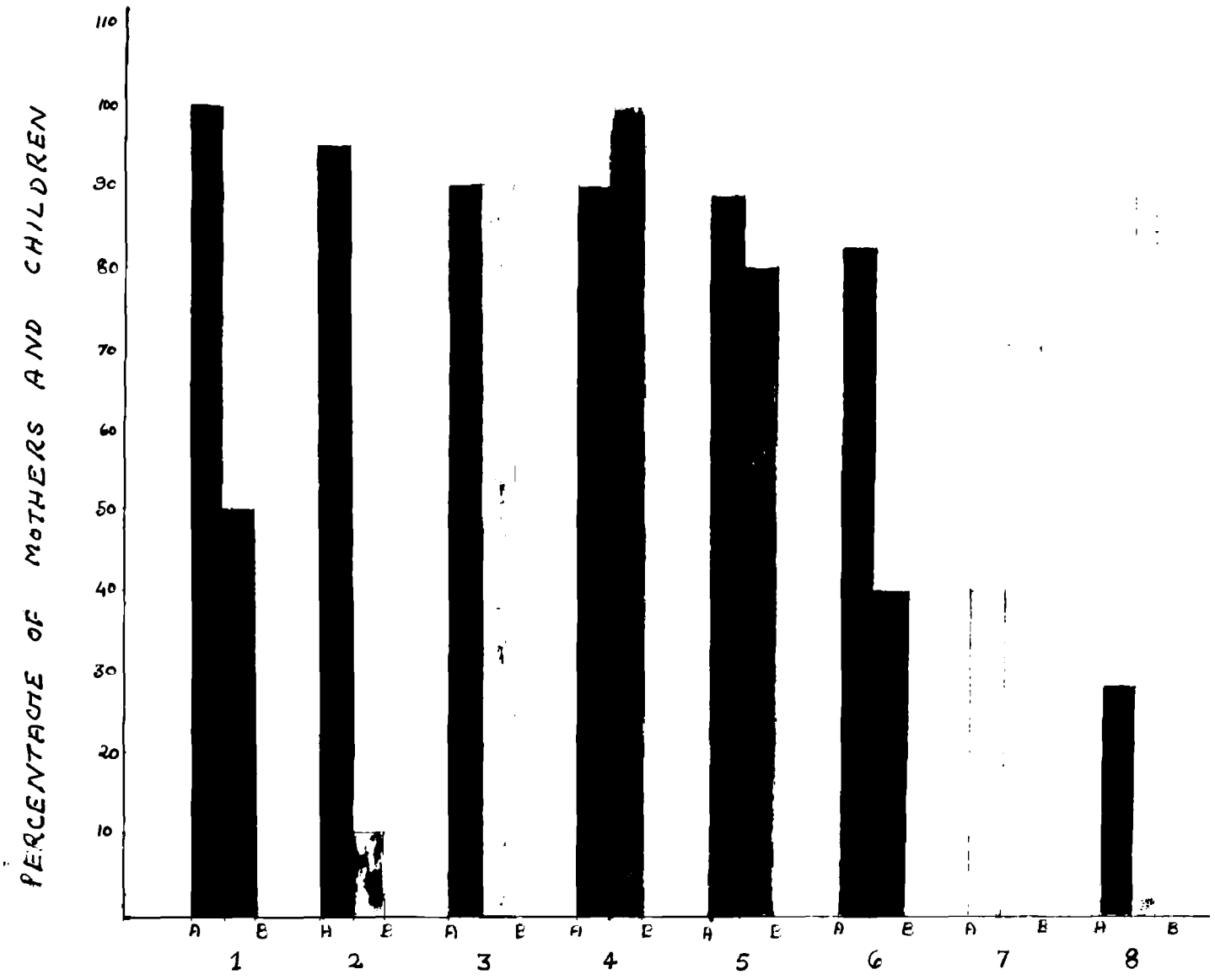
Various audio-visual aids were used for imparting nutrition education through integrated curriculum subjects. Tables XIII denotes the methods liked by mothers and pupils.

TABLE XIII

METHODS LIKED BY MOTHERS AND PUPILS

S.No.	Methods	Percentage of mothers stating	Percentage of pupils stating
1.	Lecture	100	50
2.	Home visit	95	10
3.	Exhibition	90	90
4.	Film show	90	100
5.	Demonstration	89	80
6.	Discussion	82	40
7.	Charts and posters	40	70
8.	Field trip	28	88

It is evident that a majority of (80-100%) mothers liked methods like lecture, Discussion, Exhibition, film show and demonstration which might be due to their interest in the same. On the contrary the pupils evinced greater interest in film show, exhibition, field trip and demonstration, showing the involvement of more than one sense (Figure 21).



Scale:
½" - 10 per cent

Key:
A - Mothers
B - Children

Methods:

1. Lecture
2. Ho me visit
3. Exhibition
4. Film show
5. Demonstration
6. Discussion
7. Charts and Posters.
8. Field trip.

FIGURE· 21

METHODS LIKED BY MOTHERS AND CHILDREN OF EXPERIMENAL SCHOOL

E. Assessment of weight and height and clinical assessment for experimental and control school pupils before and after nutrition education conducted

The initial and final readings of the weights and heights of children in the experimental and control school revealed an average increase of 0.8 kilogram to 4 kilogram in the case control group children and 0.9 kilogram to 5 kilogram in the case of experimental group after nutrition education, for ¢ six months (Figure 22 and Figure 23).

The average increase in the height of pupils of experimental school was 3-7 centimetres and the height of control school pupils was 2-6 centimetres (Appendix XIV). These differences in the heights and weights of pupils of the experimental school can be attributed to the nutrition education imparted to them through integrated curriculum.

The clinical assessment conducted for the experimental and control school pupils before nutrition education indicated cases of angular stomatitis, anaemia and jaundice among 20 per cent of the children in the experimental school and 25 per cent in the control school.

After nutrition education only 10 per cent of the children had these deficiency symptoms. Mothers were approached to take special care of the children. This indicated the effectiveness

FIGURE- 22
Measuring the height of a child in the experimental school

FIGURE. 23
Measuring the weight of a child in the experimental school.

of nutrition education to the school going children in the experimental school and in the case of control group, the percentage of deficiency cases remained the same.

F. Evaluation of nutritional knowledge of pupils and mothers in the experimental and control groups before and after nutrition education:

The nutritional knowledge assessed through a testing schedule, among the pupils of control and experimental schools is shown in Table XIV and Table XV.

TABLE XIV

SCORES OBTAINED BY PUPILS IN NUTRITIONAL KNOWLEDGE TEST

Scores	School lunch control										Non school lunch control									
	I Std.		II Std.		III Std.		IV Std.		V Std.		I Std.		II Std.		III Std.		IV Std.		V Std.	
	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	A
0 - 2	2	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
3 - 4	2	-	2	-	1	-	1	-	-	-	8	-	2	-	-	-	4	-	2	-
4 - 5																				
5 - 6	4	-	3	-	2	-	3	-	3	-	4	-	7	-	5	2	6	-	1	-
7 - 8	1	2	3	-	3	-	3	1	-	-	1	-	5	-	6	5	2	4	1	-
9 - 10	1	4	3	4	8	11	2	10	4	-	2	8	1	15	2	4	5	11	2	2
11 - 12	-	4	1	11	7	18	-	1	2	7	-	9	-	1	1	2	6	5	-	3
13 - 14	-	-	-	-	-	-	3	-	-	3	-	-	-	-	-	-	-	-	-	1

BN = Before Nutrition Education
AN = After Nutrition Education

The scores remained same (8-10) in the case of pupils of control school indicating the imperative need of nutrition education. There was no single student who had answered all the questions correct. The analysis of the scores of school lunch and non-school lunch children indicated a better performance of school lunch pupils with a difference in scores of 11-12, which might be due to the education through midday meals scheme.

The percentage scores obtained by pupils of experimental group are shown in Table XV.

TABLE XV

SCORES OBTAINED BY PUPILS IN NUTRITIONAL KNOWLEDGE TEST

Scores-15	Number of school lunch children in experimental school										Number of non school lunch children in experimental school									
	I Std.		II Std.		III Std.		IV Std.		V Std.		I Std.		II Std.		III Std.		IV Std.		V Std.	
	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN	BN	AN
0 - 2	3	-	-	-	-	-	-	-	-	-	4	-	1	-	-	-	-	-	1	-
3 - 4	5	-	6	-	1	-	4	-	1	-	6	-	5	-	-	-	6	3	3	-
5 - 6	2	-	7	-	4	-	7	-	3	-	5	1	11	-	7	-	11	-	6	-
7 - 8	1	-	3	-	9	-	1	1	6	-	3	-	-	1	4	3	-	-	6	-
9 - 10	3	-	-	6	2	-	1	6	1	-	-	5	-	11	5	5	-	7	-	2
11 - 12	-	11	-	10	-	2	-	6	-	-	-	12	-	6	1	10	-	6	-	4
13 - 14	-	-	-	-	-	14	-	-	-	11	-	-	-	-	-	-	-	-	-	2

BN - Before Nutrition Education
AN - After Nutrition Education

The general analysis proves that there is a considerable increase in scores obtained by the pupils of all the classes after nutrition education. The school lunch children of first, second, third and fifth standard children had gained higher scores than non-school lunch children, maximising the value of school lunch.

Thirteen knowledge test questions were administered to the mothers of experimental and control school children before and after nutrition education, results of which are shown in Table XVI.

TABLE XVI

SCORES OBTAINED BY THE MOTHERS OF EXPERIMENTAL AND CONTROL GROUP PUPILS IN THE NUTRITIONAL KNOWLEDGE TEST

Number of samples 90

S.No.	Percentage score range	Distribution number of mothers			
		Experimental		Control	
		Before	After	Before	After
1.	1 - 20	-	-	12	-
2.	21 - 40	9	-	13	-
3.	41 - 60	15	3	13	20
4.	61 - 80	27	20	19	15
5.	81 - 100	39	67	33	55

The knowledge questions which tested their learning capacity in nutrition which was imparted through various methods showed that a majority, 67 mothers of experimental group children were scoring 81 - 100 per cent marks after nutrition education indicating the positive influence of education imparted to them.

V SUMMARY AND CONCLUSION

The action research study aimed at exploring the possibilities of utilising a rural school for the promotion of nutrition conciousness among the children and mothers of selected village. The samples for the study included, First standard to Fifth standard children, numbering 280 (140 + 140) from two schools of Perur Panchayat Union villages and 180 (90 + 90) mothers of both the school children.

The results of the study are given below:

1. There were 67 children taking school lunch and 73 non-school lunch children in each of the schools selected for the study.

2. It was seen that, a majority, 35-45 per cent of the homemakers were in the age group of 30-40 years. A majority, 90-95 of them belonged to nuclear families. It is discouraging to note that 50-60 per cent of the homemakers were illiterates.

3. It was found that 35-40 per cent of the families were having 3-4 children in their families.

4. The major occupation involved by 40-50 per cent of the families was industrial work and their income ranged from Rs.200 - 400. Only meagre number of families possessed own land and hence all the others were involved in skilled or cooli work. The other sources of income were poultry, kitchen gardening, cattle and goat rearing followed by 18 per cent of the families.

5. Among the 10 teachers of both the schools, six of them had eight years of experience in teaching and the other four, two had 10 years and the other two 13 and 15 years of experience respectively. The two schools had been established before 10 and 20 years respectively and school lunch started after two years of establishment in both the schools.

6. Among the 43 per cent attending school, all the children liked school lunch, its quality and quantity. All the children evinced great enthusiasm in learning nutrition through their curriculum.

7. The results of the nutrition education conducted in the experimental school showed that the participation of children was maximum in the classes on 'Basic Food groups', preservation of fruits and vegetables, ~~and fruits~~, importance of vitamin A, balanced diet, happy family and use of fresh vegetables and fruits indicating the methods used for handling those classes and the content of topics themselves. The participation of mothers was appreciable showing their interests in the following aspects; namely importance of raw vegetables and fruits in the diet, nutrients, the deficiency diseases, kitchen gardening and principles of cooking. These topics were discussed mainly through result demonstrations, film show and exhibition which would have impressed them and facilitated them to learn better. The

scores obtained by pupils of experimental school in the various topics proved that as the lessons advanced the percentage scores also increased. It was also found that the higher class students were fairing well in the tests indicating their increased learning capacity and sense of responsibility.

9. After the nutrition education it was found that an increased 25 per cent of homemakers planned their menu, 60 per cent of them following better methods of cooking rice and vegetables. It was also found that the meal pattern permitted inclusion of locally available lowcost foods and nutritious recipes like ragi adai, papali adai, ragi and cholam murukku and inclusion of raw tomato and green leafy vegetables. All the mothers knew about the existence of Parent Teacher Association and 70 per cent of them participated regularly in the meetings conducted for them, as part of nutrition education.

10. A majority, 80-100 percent of mothers of experimented group children liked methods like lecture, discussion, exhibition, film show and demonstration whereas methods like film show, exhibition, field trip and demonstration were admired by 90-100 per cent of pupils.

11. The measurement of height and weight and clinical assessment of experimental and control school children before and after nutrition education showed a higher average increase of height

and weight in the case of pupils of experimental school. The nutritional deficiency cases were reduced by 15 percent.

12. The nutritional knowledge test conducted for the pupils and their mothers of experimental and control schools proved an average increase in scores of pupils and mothers, of experimental school, indicating the influence of nutrition education imparted to them through integrated curriculum and Parent Teacher Association.

The following recommendations are placed before the authorities by the investigator for necessary and immediate action.

1. The school lunch should include more vegetables and fruits. The menu pattern can be changed by including new recipes of the particular cereal and pulse provided for the school lunch.

2. All the elementary school teachers should be given an orientation training in nutrition for a particular period in any of the Home Science college to mitigate the crying problem of malnutrition.

3. The schools should be given provision for preparation of many audio-visual aids with which the learning process can become more meaningful, simple, understandable and interesting to the children.

4. The curriculum of the schools should permit subjects such as Home Science or Household Arts or Basic Nutrition to understand the bedrock of nutrition. If the children are made aware of good nutrition at this tender age, the future nation will have healthy and strong minded individuals to build up prosperous India.

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APPENDICES

APPENDIX I

INTERVIEW SCHEDULE TO ELICIT THE INFORMATION ON THE DIETARY PRACTICES AND NUTRITIONAL KNOWLEDGE OF THE MOTHERS OF THE EXPERIMENTAL AND CONTROL SCHOOL CHILDREN.

PART A

Name of the village

1. Family Background :
2. Name of the interviewee :
3. Educational status :
4. Occupation :
5. Age of the Home maker :
6. Family's monthly income :
7. Type of Family :
   a. Nuclear :
   b. Joint :

11. Information Regarding Children :

S.No.	Age	Numbers

2. Do you like to send your children to school.

Yes ☐ No ☐

3. How many children are attending the school?

S.No.	Number of children	girls	boys

III Details of Food productions

1. Do you have own lands

Yes ☐ No ☐

a. If yes, mention the items that are cultivated in your land?

S. No.	Items produced	Amount	Method of use		
			Sold	Family Use	Both

IV. Details of Nutrition

1. Is there any Mahalir Manram in your village?

Yes ☐ No ☐

a. If yes,

S.No.	Activities conducted	Person conducting	Problems
1	Stitching		
2	Demonstration		
3	Spinning		
4	Gardening		

V. Details regarding the PTA:

1. Is there any Parent Teachers Association in the school?

Yes ☐ No ☐

a. If yes, Reason?

b. Are you a member? Yes ☐ No ☐

If no, Reason?

2. Do you attend Parent Teachers Association meeting?

Yes ☐ No ☐

a. If yes,

1. Often
2. Regularly
3. Occasionally

3. What are the activities going on in the Patan Parent Teachers Association?

If no,

4. Do you like to have one such Association?

Yes ☐ No ☐

Reasons:

5. What are the items that can be discussed in that Association?

VI. Details of Dietary Practices:

1. Meal planning done or not

Yes ☐ No ☐

Reasons:

2. Type of working device used

3. Methods of cooking

Foods	Boiling	Steaming	Frying	Time of cutting vegetables

4. Preservations:

Foods	Methods of preservation	Keeping quality	Reason

5. Diet under special conditions:

S. No.	Conditions	Foods given	Reasons	Foods avoided	Reasons
1.	Infancy				
2.	Preschool children				
3.	Schoolgoing children				
4.	Pregnant ladies				
5.	Lactating mothers				
6.	Old age				

6. Diet in diseases

S.No.	Diseases	Foods given	Reasons	Foods avoided	Reasons
1.	Fever				
2.	Small pox				
3.	Dysentry				
4.	Cold and cough				

7. Are you satisfied with the way you feed your family?

Yes ☐ No ☐

8. Daily Meal Patterns

Days	Breakfast	Lunch	Tea	Dinner
1				
2				
3				
4				

PART B

KNOWLEDGE IN NUTRITION

1. Which method is best for cooking rice?
   a. Draining the water
   b. Absorption
2. How can vegetables be stored effectively?
   a. Keeping the plate or basket
   b. Janatha refrigerator
3. In the following which is good?
   a. Hand pounded rice
   b. Milled rice
4. Which is the best methods of cooking keerai?
   a. Boiling for a along time
   b. Boiling for a short time
5. How can we include tomato in our diet to get all its nutrients?
   a. Cooked form
   b. Raw form
6. How should we cut vegetables?
   a. Into small pieces
   b. Into big pieces
7. When should we wash vegetables?
   a. Before cutting
   b. After cutting

8. Which are the food items to be given to the people with poor digestibility?

   a. Liquid food

   b. Solid food

9. What is balanced diet?

   a. Consuming cereals alone

   b. Consuming pulses and fruits with adequate cereals

10. Which is best for vision?

   a. Carrot

   b. Banana

11. Which of the following given energy?

   a. Cereals

   b. Green leafy vegetables

12. Which of the following cereals better?

   a. Ragi

   b. Rice

13. What should growing children eat?

   a. Milk

   b. Sweet

APPENDIX - II

INTERVIEW SCHEDULE TO THE CHILDREN

Name of the Investigator:

PART A

I. Personal Details

1. Name of the school :
2. Name of the village :

Class :

Date :

3. Name of the child :
4. Age :
5. Sex :
6. Occupation of the Father/Guardian :

II. Details of participation in school

1. Do you take school lunch?

Yes ☐ No ☐

Reasons:

2. What is the distance between your school and home?

3. Do you like the school lunch?

Yes ☐ No ☐

Reasons:

4. What are the food provided in the school lunch?

   1.

   2.

   3.

   4.

   5.

5. Is the quantity?

   Enough ☐ Too little ☐ Too much ☐

6. Is the quantity

   Good ☐ Fair ☐ Poor ☐

7. Do you take part in the follwing action?

   Yes ☐ No ☐

   If yes, give the following details

S.No.	Activities	Yes	No	Reason
1.	Cutting vegetables			
2.	Cooking			
3.	Serving			
4.	Cleaning vessels			
5.	Gardening			
6.	Others			

8. What do you tell your parents about the school lunch?

9. What is your meaning for nutrition?

10. Are you interested in learning about nutrition

Yes ☐ No ☐

Reasons:

11. Are you taught nutrition in the school?

Yes ☐ No ☐

a. If yes topic?

12. Would you like to attend a class in nutrition if organised?

Yes ☐ No ☐

Reasons:

APPENDIX III

INTERVIEW SCHEDULE TO ELICIT THE INFORMATION FROM TEACHERS IN THE ELEMENTARY SCHOOL:

1. Name of the village :
2. Name of the teacher :
3. Experience in years of months :
3. Details about the training of the teachers:

S. No.	Training undergone	Duration of training		-place	Subject learned during training
		No.of year	From to		

IV. General information about the school:

1. Year of establishment of the school
2. Year in which feeding programme was started
3. Alletted capacity of the whole class
4. Total number of children attending the class
5. Age range of children

S.No.	Age range	Number of boys	Number of girls

APPENDIX - IV

SCHEDULE FOR CLINICAL ASSESSMENT

NAME OF THE VILLAGE - DATE OF ASSESSMENT

NAME OF THE SUBJECT - INITIAL FINAL

AGE OF THE SUBJECT - HEIGHT (cm):

SEX OF THE SUBJECT -

NAME SEX OF THE HEAD OF THE FAMILY -

CLINICAL EXAMINATIONS	INITIAL	FINAL
1 HAIR		
1.1 Sparse		
1.2 Discoloured		
1.3 Easily plucked		
2. FACE		
2.1 Moon Face		
3 EYE		
3.1 Conjunctival xerosis		
3.2 Bitot's spots		
3.3 Corneal xerosis		
3.4 Keratomalacia		
4 LIPS		
4.1 Angular stomatitis		
5 TONGUE		
5.1 Red and Raw		
5.2 Papillae atrophic		
6 TEETH		
6.1 Mottled Enamel caries		

CLINICAL EXAMINATIONS	INITIAL	FINAL
7 GUMS		
7.1 Spongy bleeding		
8 GLANDS		
8.1 Thyroid - Enlargement		
Parotid - Enlargement		
9 SKIN		
9.1 Follicular hyper keratosis		
9.2 Pellagrous dermatitis		
9.3. Pallor (Anaemia)		
10 SUBCUTANEOUS TISSUE		
10.1 Oedema		
11 MUSCULO SKELETAL SYSTEM		
11.1 Breading of Ribs		
11.2 Knock knees		
11.3 Bow legs		
12 GASTRO INTESTINAL SYSTEM		
12.1 Enlargement of spleen		
12.2 Enlargement of liver		
13 NERVOUS SYSTEM		
13.1 Tenderness of calf muscles		
13.2 Loss of knee/ankle Jerks		
13.3 Numbness And Tingling of Extrimities/Burning feet		
14 FRANK SIGNS OF MALNUTRITION		
14.1 Marasmus		
14.2 Kwashiorkor		
14.3 Rickets		

APPENDIX V

IMPORTANCE OF MILK, GREENS AND EGG

இந்தாங்கோ இந்தாங்கோ
இந்தப் பாலை குடியுங்கோ
பலமில்லை குழந்தைகளுக்கு
பலத்தைக் கொடுக்கும் பால்
ஆரோக்கியமாய் வளரவே
உதவி செய்யும் பால் — (இந்தாங்கோ)

பாலுடனே முட்டையையும்
கலந்து பூசித்தும் பாருங்கோ
விலாதிகளெல்லாம்
ஓட்டும் விதத்தைப் பாருங்கோ (இந்தாங்கோ)

பச்சைப் பசேல் என்ற கீரை
சமைத்து தினமும் சாப்பிடுங்கள்
இனிமையான இரும்புச் சத்து
இதிலே இருக்குது கேளுங்கள் (இந்தாங்கோ)

APPENDIX VI

DRAMATISATION OF IMPORTANCE OF VITAMIN-A

ஒரு நாடகம்

உயிர்ச் சத்து 'ஏ'யின் முக்கியத்துவம்

காரட்: நான்தான் காரட். என்னிடம் மிகுதியான உயிர்ச்சத்து 'ஏ' உள்ளது. உங்களுடைய அழகான கண்களுக்கு நான் தேவையானவன். நான் குறைந்த விலையில் கிடைப்பேன். உங்கள் பள்ளித் தோட்டத்திலும், வீட்டுத் தோட்டத்திலும் வந்து இருந்து பயனளிப்பேன்.

கீரை நான் யார் தெரியுமா? நான் உங்களுடைய நல்ல நண்பன். நான் உங்களுக்கு பல விதங்களில் உதவி செய்வேன். என்னிடம் மிகுதியான உயிர்ச்சத்து 'ஏ' உள்ளது. நான் உங்களை கண் வியாதிகளிடமிருந்து தப்புவதற்கு மிகவும் முக்கியமானவன்.

பப்பாளி உங்களுக்கு என் பெயர் தெரியுமா? தெரியாவிட்டால், என்னுடைய உருவத்தாலேயே என்னை அறிமுகப்படுத்திக் கொள்கிறேன். என்னிடம் ஏராளமான உயிர்ச்சத்து 'ஏ' இருக்கிறது. உங்களுக்கு நல்ல பார்வை கிடைக்க, என்னை போதிய அளவு சாப்பிட்டால் போதுமே.

தக்காளி குழந்தைகளே! நான்தான் உலகத்திலேயே சிறந்த நிறமுடையவன். நான் உங்களுக்கு உயிர்ச்சத்து 'ஏ' ஐக் கொடுத்து உங்கள் சிறிய கண்களைப் பிரகாசமடையச் செய்வேன்.

வெள்ளெலி நீங்கள் என்னை எங்கேயாவது பார்த்ததுண்டா? உங்களுக்குத் தெரியுமா, நான் எங்கேயிருந்து வந்தேன் என்று? நீங்கள் பால் பண்ணைக்கு வரும் பொழுது என்னை காண்பீர்கள். என்னிடம் உள்ள ஏராளமான உயிர்ச்சத்து 'ஏ' உங்கள் நல்ல பார்வைக்கு மிகவும் தேவைப்படுகிறது.

APPENDIX VII

SONGS OF VEGETABLES AND ITS FUNCTIONS

பாகு பாகு கேரட்டு
மஞ்சள் நிற கேரட்டு
அழகான கண்ணுக்கு
அருமையான கேரட்டு

பச்சையாக சாப்பிட்டால்
பார்வை தரும் கேரட்டு
தினமும் நாமும் சாப்பிட்டால்
சிவந்த மேனி அடையலாம்

தக்காளியாம் தக்காளி
சிவந்த நிற தக்காளி
செழித்து வளரும் தக்காளி
தினமும் ஒன்று சாப்பிட்டால்
சிவந்த மேனி அடையலாம்

நெல்லிக்காயாம் நெல்லிக்காய்
அருமையான நெல்லிக்காய்
அழகான மேனிக்கு
அளவிலும் உள்ளலாம்

உயர்ந்து நிற்கும் மரத்திலே
உருண்டையான நெல்லிக்காய்
உறவான பல்லுக்கு
உள்ளவேண்டும் நெல்லிக்காய்

வாயில் போட்டால் இனிக்கும்
வைட்டமின் 'சி' யைக் கொடுக்கும்
நீண்ட ஆயுள் இருக்க
நித்தம் நித்தம் உண்ணலாம்

பப்பாளிப்பழம் மரத்திலே
பழுத்துப் போகும் மரத்திலே
குருவிக்குஞ்சு பறக்குது
பிடிச்சிட்டு வாடி முத்தம்மா
பப்பாளிப்பழம் பறிக்கலாம்
பாங்காய் நாமும் உண்ணலாம்

மைசூர் மாம்பழம்
பெங்களூர் பப்பாளி
அம்மா, அப்பா ஓடிவாங்க
பழத்தை தட்டில் வையுங்க
எடுத்து எடுத்து நீங்களும்
இன்பமாக சாப்பிடுங்க.

APPENDIX VIII

QUIZ ON FOODS AND ITS IMPORTANCE

1. Name the insects which causes malaria?
2. What are the vitamins present in papaya and carrot?
3. Which nutrients protect our bones and teeth ?
4. What should we do to be healthy?
5. What are the body building nutrients?
6. What are the energy giving nutrients?
7. From where do we get Vitamin D ?
8. What are the rich sources of iron?
9. What are the Vitamins present in fish liver Oil?
10. Name the nutrients present in guava and amla?
11. State rich sources of protein?
12. What is the reason for Kwashiorkor?
13. What are the deficiency disease due to the lack ~~talk~~ of vitamin B.

Answer for Quiz:

1. Moisquito
2. Vitamin A
3. Minerals
4. To take bath every day
5. Proteins and minerals
6. Carbohydrate and fats
7. Fish liver oils.

8. Green leafy vegetables
9. Vitamin D
10. Vitamin C
11. Pulses, fleshy foods
12. Due to the deficiency of protein and calories.
13. Angular stomatitis

APPENDIX IX

STORY ON IMPORTANCE OF VITAMINS A

வைட்டமின் 'ஏ'ன் முக்கியத்துவம்

குழந்தைகள் மைதானத்தில் மகிழ்ச்சியுடன் விளையாடிக் கொண்டிருந்தனர். அவர்களில் ராமுவும், கோபுவும் தொழிகள். அவர்களும் அதில் மகிழ்ச்சியாகப் பங்குபெற்று விளையாடிக் கொண்டிருந்தார்கள்.

மாலையில் சிறிது நேரம் விளையாடியவுடனே கோபு சோர்வு அடைந்து ஒரு இடத்தில் அமர்ந்து விட்டான். இதைக் கண்ட ராமு, அவனை அவனது வீட்டிற்கு அழைத்துச் சென்றான்.

மறநாள், ராமுவின் அம்மா, கோபுவின் அம்மாவிடம் "உங்கள் மகன் மாலை நேரவுடன் என் விளையாட முடியாமல் வீட்டிற்கு வந்துவிடுகிறான். மேலும் சோர்வாக வேறு காணப்படுகிறான்" என்றாள். அதற்கு கோபுவின் அம்மா, தன் மகனுக்கு மாலையானவுடன் கண் தெரிவதில்லை. அதனால் மாலையானவுடன் சீக்கிரமாக வீடு திரும்பி விடுகிறான் என்றாள்.

அதைக்கேட்ட ராமுவின் அம்மா, 'ஐய்யோ', இது மாலைக் கண் வியாதியாயிற்றே. இதற்கு நீங்கள் மிகவும் கவனம் செலுத்த வேண்டுமே. இல்லையென்றால் இவனுக்குக் கண் மிகவும் பாதிக்கப்படும் என்றாள். இதைக் கேட்டதும் கோபுவின் அம்மா, மிகவும் கவலையுடன் "இதற்கு என்ன செய்வது"? என்றாள்.

அதிலிருந்து தினந்தோறும் கோபுவின் அம்மா அவனுக்கு கீரை வகைகள், காய்கறிகள், முதலியவற்றை உணவில் சேர்த்து சேர்த்து உண்ணச் செய்தாள். அதனால் அவனுடைய மாலைக் கண் நோய் நிவர்த்தி செய்யப்பட்டது.

APPENDIX X

SONGS ON HEALTH HABITS

1. சுத்தம் சுத்தம் சோறுபோடும் சுகாதாரமாகும்
நித்தம் நித்தம் குளித்துவிட்டால் நீண்ட காலம் வாழ்வோமே
நோய்களெல்லாம் அவனோடத்தில் தோல்வியடைந்து போகுமே
தன்பமென்னும் தோணியே தோற்ற தன்பப்பட்டிடும்
மக்களெல்லாம் இன்பத்துடன் மகிழ்ந்து விளையாடுவே
என்றும் இந்த சுத்தத்தினை எடுத்துக்காட்டி நடப்போமே

2. நல்ல நல்ல பிள்ளைகளே நலமான பிள்ளைகளே
வளமோடு வாழ்ந்திட்டால் வையகமும் பெற்றிடலாம்
வளமான வாழ்விற்கு வைத்தியரை நாடுவானேன்.
வைத்தியரும் நம்மூடலே வளமாகக் காப்பாற்ற,
முத்தடுப்பு ஊசிதனை முறையாகவும் போட்டுவானே
முத்தடுப்பு ஊசிதனை முறையாகப் போட்டுக் கொண்டால்
முன்வரிந்த நோயிலிருந்து நீங்கிநின்பம் பெற்றிடலாம்

APPENDIX XI

A SONG ON KUMMI

1. கும்மியடி நல்ல கும்மியடி
கும்பிட்டுக் கும்பிட்டுக் கும்மியடி
ஆரோக்கிய வாழ்வினையும் பெற்றிடவே – நல்ல
சத்துணவை உண்டு வாழ்ந்திடுவோம் (கும்மியடி)

2. உடல் வளர்ச்சியையும் பெற்றிடவே
புரதச்சத்துமே தேவையம்மா
புரதச்சத்தினையும் பெற்றிடவே
பருப்பு வகையும் உண்டிடுவோம் (கும்மியடி)

3. வேண்டிய சக்தியை பெற்றிடவே
கலோரிகளும் தேவையம்மா – வேண்டிய
கலோரியையும் பெற்றிடவே
தானியம் பாலும் உண்டிடுவோம் (கும்மியடி)

4. எலும்பு, பற்கள் வளர்ச்சிபெற
உயிர்ச் சத்துக்கள் தேவையம்மா
உயிர்ச்சத்தினையும் பெற்றிடவே
காய்கனிகள் பாலும் உண்டிடுவோம் (கும்மியடி)

APPENDIX XII A

DETAILS OF SCORE OBTAINED FOR INDIVIDUAL TESTS

S.No.		Tests conducted for each topic	Percentage of score obtained in First class	Average of the percentage score obtained
1.	a	Intelligeant test	40	32
	b	Memory test	30	
	c	Written test	26	
2.	a	Dictation	42	
	b	Oral questions	35	38
	c	Sample drawings	37	
3.	a	True and false test	34	
	b	Written test	46	40
4.	a	Repetion of songs	41	41
5.	a	Working out problems	45	
	b	Dictation	44	
	c	Rememberance of songs	50	45
	d	Oral questions	41	
6.	a	Display of samples	45	
	b	Memory test	55	50
7.	a	Drawing pictures shown	50	
	b	Written test	54	52
	c	Match the following	52	
8.	a	Oral questions	50	54
	b	Quiz	58	
9.	a	Written test	60	
	b	Fill up the blanks	58	58
	c	Tick the correct answers	56	
10.	a	Oral questions	62	62
11.	a	Memory test	65	
	b	Written test	67	66
12.	a	General Readingss	70	70

B. DETAILS OF SCORE OBTAINED FOR INDIVIDUAL TESTS

S.No.		Test conducted for each topics	Percentage of the score obtained in II class	Percentage of the score obtained
1.	a	Memory test	36	38
	b	Dictation	40	
2.	a	Remembrance of songs	44	40
	b	Tick the correct answers	36	
3.	a	Oral questions	40	
	b	Fill up the blanks	42	43
	c	Story telling	47	
4.	a	Quiz	48	47
	b	Match the following	46	
5.	a	Working out problems	49	49
6.	a	Written test	50	51
	b	Dictation	52	
7.	a	Knowledge test	47	
	b	Fill up the blanks	53	53
	c	Remembrance of songs	59	
8.	a	True false test	58	55
	b	Oral questions	52	
9.	a	Match the following	58	
	b	Picture quiz	53	57
	c	Remembrance of songs	60	
10.	a	Dictation	59	59
	b			
11.	a	Written test	60	61
	b	Drawing pictures	62	
12.	a	Repetition ~~Repition~~ of songs	63	63

C. DETAILS OF SCORE OBTAINED FOR INDIVIDUAL TESTS.

S.No.		Tests conducted for each topic	Percentage of the score obtained in III class	Average in of the percentage score obtained
1.	a	Puzzles	40	42
	b	Written test	44	
2.	a	Memory test	48	
	b	Working out problems	40	45
	c	Tick the correct answer	47	
3.	a	Rememberance of songs	50	
	b	Oral questions	51	49
	c	Drawing from memory	46	
4.	a	Match the following	50	52
	b	Dictation	54	
5.	a	Drawing the pictures	54	
	b	Working out problems	52	54
	c	Oral questions	56	
6.	a	Fillup the blanks	55	57
	b	Written test	59	
7.	a	Memory test	58	60
	b	Oral questions	62	
8.	a	Dictation	62	63
	b	List out the fruits and vegetables for preservation	64	
9.	a	Written test	62	65
	b	Oral test	68	
10.		Explain the following		
	a	What is balanced diet	68	69
	b	What are the special foods to be given to children	70	
11.	a	Fillup the blanks	70	72
	b	Drawing pictures	74	
12.	a	Write a brief story on "Happy family"	78	78

D. DETAILS OF SCORE OBTAINED FOR INDIVIDUAL TESTS.

S.No.	Tests conducted for each topic	Percentage of score obtained in IV class	Average of percentage scores
1.	a Mazzles	47	48
	b Written test	48	
	c Rememberance of songs	49	
2.	a True false test	44	50
	b Oral questions	56	
3.	a Written test	50	
	b Drawing pictures	51	52
	c Fillup the blanks	55	
4.	a Tick the correct answers	57	58
	b True false test	59	
5.	a Working out problems	58	
	b Oral test	59	60
	c Match the following	63	
6.	a Fill up the blanks	62	62
	b		
7.	a Match the following	63	64
	b List out the foods under the Five Food Groups	65	
8.	a List out the foods used for preservation	67	68
	b. What is preservation ?	69	
9.	a Quiz	69	70
	b Repftiton of songs	71	
10.	a List out the special food used by the school going children	73	73
11.	a What is balanced diet	74	75
	b List out foods rich in Vitamin A	76	
12.	a Written test	77	77

E. DETAILS OF SCORE OBTAINED FOR INDIVIDUAL TESTS.

S.No.		Tests conducted for each topic	Percentage of score obtained in V Class	Average of the percentage score
1.	a	List out the nutrients present in dhals and cereals	48	
	b	Draw the picture of Vitamin C rich food	52	50
2.	a	Quiz on protein rich foods	50	
	b	Fill up the blanks	52	54
	c	Tick the correct answers	60	
3.	a	Oral questions	57	58
	b	Rememberance of song	59	
4.	a	List out foods come under vitamins and minerals	61	61
5.	a	Working out problems	60	64
	b	Written test	68	
6.	a	Fill up the blanks	63	
	b	True-false test	68	67
	c	Dictation	70	
7.	a	Written test	69	69
8.	a	What is preservation	68	72
	b	What are all the methods used for preservation	76	
9.	a	Write down the brief story on Vitamin A	76	77
	b.	Repetition of songs	78	
10.	a	List out the disease you have Been in slides	78	79
	b	Match the following	80	
11.	a	Drawing the picture	83	83
12.	a	Write a brief story on "Happy Family"	88	88

APPENDIX XIII

RECIPES OF COOKING DEMONSTRATION.

A Name of the recipes	:	Papali Adai

Ingredients:

Raw papaya	:	75 grm.
Black gram dhal	:	100 gm.
Red Gram dhal	:	100 gm.
Ragi	..	400 gm.
Cholam	..	300 gm.
Small onion	:	50 gm.
Green chillies	:	15 gm.

Method

Soaked the black gram dhal, red gram dhal, ragi, and cholam. Ground these ingredients into a paste form. Seasoned the papaya scrapings, green chillies and small onion. Mixed it with the paste and made it into Dosai.

B Name of the recipe : Tomato Jam

Ingredients

Tomato	:	500 gm.
Jaggery	:	250 gm.
Cardamon	:	5 gm.
Groundnut	:	50 gm.

Method :

Washed the tomatos well. Boiled the tomatos with some water. After 15 minutes took out from the fire. Then mashed the cooked tomato and removed the seeds and kept aside. Jaggery were cooked with water. Heated it till it became a thread stage. Now added the mashed tomatos and left it on the stove untils a thick eosistency was reached. Then took out from the stove and added the powdered cardamum and groundnut and mixed well.

It is good to serve as a side dish for ragi and dosai.

C Name of the recipe : Ragi balls

Ingredients:

Ragi flower	:	500 gm.
Coconut	:	150 gm.
Cumin seed	:	10 gm.
Salt	:	to taste

Method:

Mixed the ragi flour with water, salt, coconut and cumin seed and made it into a doughform. Then formed into a small ball. Kept the steamboiler into the stove. Put the ball in the steam boiler when it became steamed, removed from the fire and kept it for cool.

This serving was used to served as a snack for small children and mothers.

B Name of the recipe : Vegetable pickle

Ingredients:

Carrot	:	50 gm
Brinjal	:	50 gm
Beans	:	50 gm
Beetroot	:	50 gm
Greenchillies	:	10 gm
Red chillie Power	:	20 gm
Salt	:	for salting
Mustard	:	10 gm
Groundnut oil	:	100 gm.

Method:

Cut the vegetables into small pieces. After washing, then seasoned them in a frying pan. Took it after it seasoned. Then put that seasoned vegetables in a vessel. Then fried the red chillie powder and mixed it with the seasoned vegetables. The vegetable was transferred to a dried vessel and kept aside.

APPENDIX XIV - A

AVERAGE INCREASE IN HEIGHT OF EXPERIMENTAL AND CONTROL SCHOOL CHILDREN

S.No.	Increased in height (cm.)	Number of children stating (Experimental) Number of Children stating control)											
		Age range (in years)						Age (Range (In years)					
		6 - 8		8 - 10		10 - 12		6 - 8		6 - 8		10 - 12	
		SI	NSL	SL	NSL	SL	NSL	SL	NSL	SL	NSL	SL	NSL
1	0 - 1	8	12	6	2	2	1	10	9	6	7	1	1
2	1 - 2	2	6	5	6	2	2	10	12	5	7	-	3
3	2 - 3	2	11	3	5	-	1	5	9	3	4	-	-
4	3 - 4	2	4	2	4	3	1	4	3	3	1	1	-
5	4 - 5	I	1-	2	3	4	2	1	2	4	3	1	-
6	5 - 6	-	1	4	3	1	-	2	1	1	1	1	-
7	6 - 7	1	1-	5	2	1	1	-	1	-	-	-	-
8	7 - 8	-	1	4	1	-	-	-	1	-	-	-	-
9	8 - 9	-	-	1	3	1	-	1	-	-	-	-	1
10	9 - 10	-	-	1	2	-	-	-	-	-	-	-	-
Nil	Nil	3	1	-	1	1	-	6	1	1	1	1	1

SL : School Lunch Children
NSL : Non-school Lunch children

APPENDIX XIV - B

AVERAGE INCREASE IN WEIGHT OF EXPERIMENTAL AND CONTROL SCHOOL CHILDREN

S.No.	Increased in Weight (in kg.)	Number of children stating (Experimental) Age range (in years)						Number of Children stating control) Age range (in years)					
		6 - 8		8 - 10		10 - 12		6 - 8		6 - 8		10 - 12	
		SL	NSL	SL	NSL	SL	NSL	SL	NSL	SL	NSL	SL	NSL
1	0 - .5	5	6	4	4	4	3	-	1	-	-	-	-
2	.6 - 1	11	17	20	14	3	3	15	5	10	13	1	2
3	1.5 - 2	2	-	9	3	5	6	14	11	7	7	1	2
4	2.4 - 3	1	-	-	1	2	1	9	5	4	5	1	1
5	3.5 - 4	-	-	-	-	-	-	-	4	-	-	1	1
6	4.5 - 5	-	-	-	-	-	-	-	1	1	-	-	-
7	5.5 - 6	-	4	-	-	-	1	-	-	-	-	-	-
8	6.5 - 7	-	-	-	-	-	-	-	-	-	-	-	-
9	7.5 - 8	-	-	-	-	-	-	-	-	-	-	-	-
10	Nil	-	-	-	10	1	-	1	2	1	3	1	-

SL : school lunch children

NSL : Non-school lunch children